

# COMMERCIAL CAR JOURNAL

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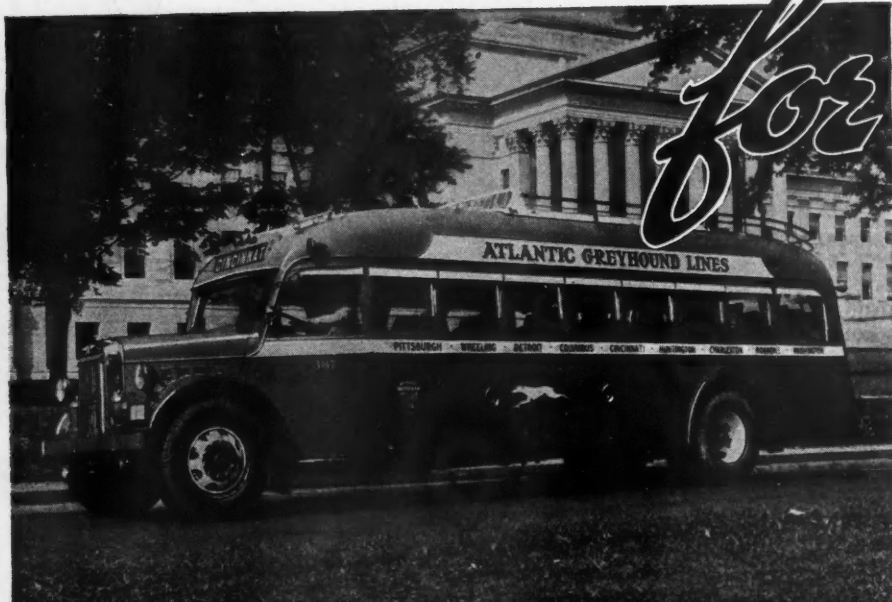
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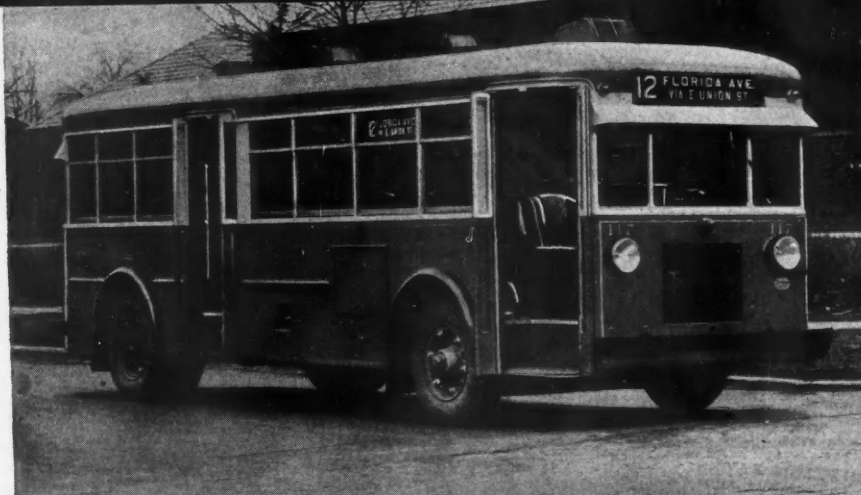
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COMMERCIAL CAR JOURNAL





# The Overload

## An Explanation . . .

**I**F you get the impression that diesels dominate this issue, don't blame us; we can't help it if things happen. Mr. Anthony, of the Pacific Freight Lines, dug into his firm's operating costs and came up with a batch of interesting statistics comparing diesel costs with gasoline engine costs. Naturally we rushed into print with them because we know you want to see the figures. You'll be glad to know that Mr. Anthony lays all the cards on the table.

## . . . Not An Apology . . .

**AND**, of course, we couldn't stop Hercules and Buda from announcing their new, small diesel engines. We gave you the dope on Cummins' small diesel back in August, but we managed to get a performance chart so that you would have everything you need on the small diesels at your fingertips. That reminds us to tell you that from here in every engine description we publish will contain a performance chart. We want to make it easy for you to create your own file of charts for reference.

## . . . And We're Not Sorry

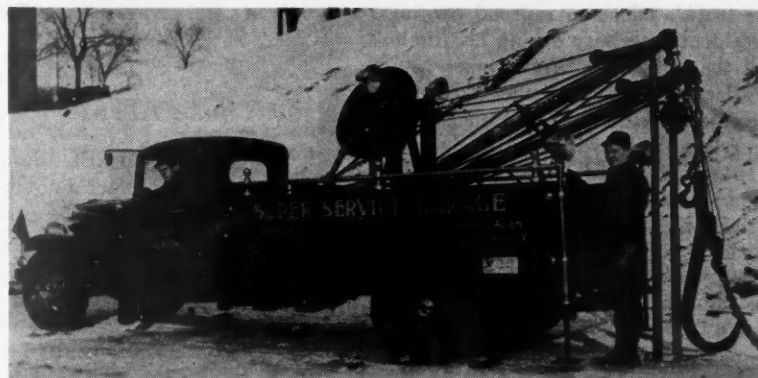
**LIKEWISE** we couldn't prevent the T-men (T for transportation—and keep that right jab under control) from straying into a discussion of diesels at the Newark Truck Show meetings. So you'll find a report on the inside. And so much diesel material naturally gave us a not-to-be-overlooked opportunity to editorialize on a pet peeve—so we editorialized.

## Balancing the Diet

**HOWEVER**, there's lots in the issue that has nothing to do



A gory reminder of what might happen to a driver in his next accident is displayed in the above fashion on New York's highways. The car is one that was in an actual accident caused by defective brakes. Two dummy figures realistically smeared with red paint make gruesome images of death. You might get the creeps looking at it—but will you heed its warning? A Mack truck, loaned by the United States Trucking Corp., totes it around



Where there's smoke there's fire and where there's need for a super-wrecker, such as this one, you get a pretty good idea of the conditions truck operators must contend with on Michigan highways where the snow level rises 10 ft. and the thermometer goes to 10 below—and then some. This truck operated by Super Service Garage, of Douglas, sports a first aid kit, three winches, repair parts, etc., among its equipment and is prepared to help the "heaviest truck and load" out of any hole, snow drift and/or including what have you

with diesels and is equally interesting. Heading the list is an article giving the results of a lubrication survey in which 500 operators were asked to cooperate. A close second is something new in the way of a semi-trailer operation—one in which two firms, entirely independent, cooperate in a trailer switching arrangement. Equally close is an article surveying the vocational uses of aluminum body materials. Aluminum has a big anniversary coming up next year, so we're simply anticipating it. The human interest interlude is furnished by an article on "Delivering Skyscrapers by Truck," in which you can relax and enjoy the trucking troubles of a trucker whose troubles are always big ones. Of course there's a safety article—we wouldn't be without one, and a bit of truck propaganda (p.23) that's proper-ganda because it's all based on fact and involves the daily comfort of millions of persons. The regular departments complete the

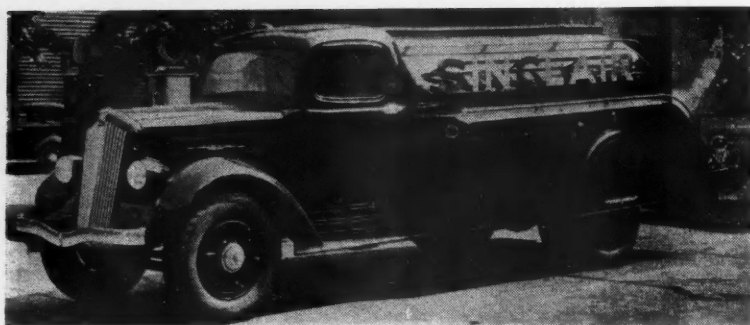
issue, including complete specifications and truck registration figures.

## Trailing Crime

**TRUCKS** have been put to a lot of uses, mostly good, but some bad, such as the criminal uses in bootlegging and cattle-rustling. Now crime detection has taken to trucks. District Attorney Martin W. Littleton, of Mineola, L. I., has ordered a truck and trailer which will be his D. A. office on wheels. The trailer will be equipped with telephone connections, radio and general office equipment. The idea is to expediate the solution of crime in the "wide open spaces"—of Long Island, we take it.

## Railroad Admission

**RAILROAD** officials frequently say the fairest things about trucks in public, but their views don't



Left—One reason why oil companies have always taken the lead in adopting modern styled trucks to their operation is because the trucks serve as such excellent advertising mediums. This streamlined White, "styled by the Count," is Sinclair's latest acquisition. Below—The poor fish gets a break. A Fruehauf semi-trailer hauls 10-tons of him, packed in ice, from Lakes Michigan and Erie into the Cincinnati area so that Fridays may not pass without fresh sea food. New Fisheries Co., Cincinnati, Ohio, the operator, glorifies its haul by lettering its name to simulate the shape of a fish

## THE OVERLOAD

seem to weigh with the railroad propaganda mills that grind out the same old vicious tripe to arouse public antagonism to trucks. President Willard of the B. & O. has always minimized the truck's effect on railroad earnings. President Atterbury during his lifetime felt the same way. Now comes L. W. Wallace, director of the Equipment Research Division of the Association of American Railroads, who declared in a speech in Philadelphia that less than 5 per cent of the decrease in railroad freight business was actually due to truck competition. "It is true the trucks have taken some business from us," he said, "but not as much as most people imagine." Will anti-truck propagandists please clip this item and stick it in the hats through which they have a habit of talking?

### A Preview of 1960

**HAVE** you ever stopped to figure the statistical changes likely to occur in the automotive industry during the next 25 years? Well, the executive committee of the American Petroleum Institute has (in order to gage fuel demand) and we calculate you'll like the calculations. Here they are: Population increase from 122,775,000 in 1930 to 146,000,000 in 1960; passenger car increase from 22,400,000 in 1935 to 31,100,000 in 1960; motor truck increase from 3,600,000 in 1935 to 6,000,000 in 1960.

### What Ho! Economy!

**THE** fuel demand is estimated in the following consumption figures: In 1935 the average motor vehicle is using annually 690 gal. of motor fuel. This is expected to increase to 730 gal. in 1940, partly due to the increase in trucks; after which, because of the trends toward lighter cars and changes in engine design, a continuing reduction is expected, bringing the requirement down to 670 gal. in 1960.



### Hey Youse API's!

**DIESEL** development evidently doesn't enter into the A.P.I. calculations at all. The word isn't mentioned in the entire 15-page report.

### Presidential Timber?

**FARMERS** seem to get all the breaks where truck taxation and regulation is concerned. Down in South Carolina the Governor himself is fighting for a flat \$3 registration fee for cars and trucks of not more than 1½-ton capacity—"a size," says a news despatch, "largely used by farmers." The Governor is fighting so hard that he even ousted, at the point of machine guns, a State Highway Department that was hostile to his idea. We know some truckmen who would consider the Governor presidential timber.

### One For the Book

**A** MID-WEST judge started something when he sentenced to prison for reckless driving, not the driver, but the car. A neat legal question occurs to us. Let's say the driver was a drayman and the car a truck, and his sole means of livelihood. Would the judge have the power to put the man's "business" in jail? Oh, well, it's problems like this that help pass the time away.

### Safety Book Free

**SPEAKING** of reckless driving, there's a swell booklet of 64 pages entitled "I Drive Safely" that is available for the asking. It's a

book of instruction for drivers of trucks. Subjects treated include speed, brakes, rules of the road, safety loading factors, steering, tires, lubrication, mechanical equipment, garage accident hazards, etc. Proper maintenance of the vehicle is outlined in non-technical language. Our suggestion is that you check "A" on the page opposite, let us have it sent to you, and after looking it over you can decide whether you'd like to have each of your drivers receive a free copy. It's a swell suggestion, if you ask us.

### Don't Burn Your Bridges

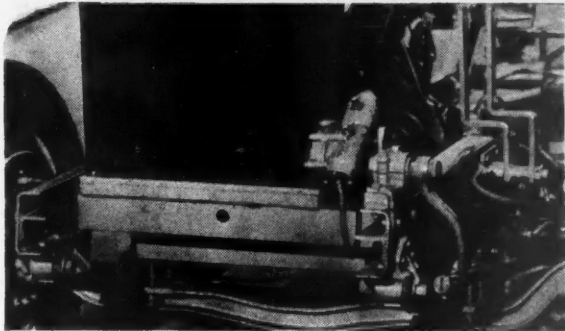
**WHEN** trucks cross their bridges it means prosperity. At least that is the sentiment of the New York Port Authority which reports that truck traffic is on the up and up—has been for the last nine months—and the Port Authority is ready to wager that the upward trend of truck traffic will stay up. Traffic over the George Washington bridge, the Holland Tunnel and three New Jersey spans has increased 12 per cent in the last nine months. That means 1,914,212 trucks are contributing to prosperity just by crossing bridges. If you are interested, Holland Tunnel reports 8037 truck crossings in a banner day. Maybe what this country needs are fewer corners to round and more bridges to cross.

### We're Wishin'

**IT'S** a bit early (still 24 shopping days left) but it's our last chance to wish you, with utmost sincerity, A Merry Christmas and a Happy and Prosperous New Year.



**INFORMATION WHICH  
IS INSIDE, ADVANCE  
OR JUST UNUSUAL**



#### Friends, Romans . . .

We have so much to whisper into your ear this month that to get it all on this page we'll have to make each whisper short and snappy, but you can count on us not to be vague except where imposed confidence compels us to conceal identities. So, sh-h-h, turn your good ear this way. . . .

#### Diesel Deluge Due

Our estimates, based on conversations with various manufacturers, indicate that more than 20,000 truck-type diesel engines will be built in the U. S. in 1936. That means lower prices. One maker is actually fearful that the demand may be greater than his supply—and he plans to build 50 a day.

#### Lo, the Prophet's Neck

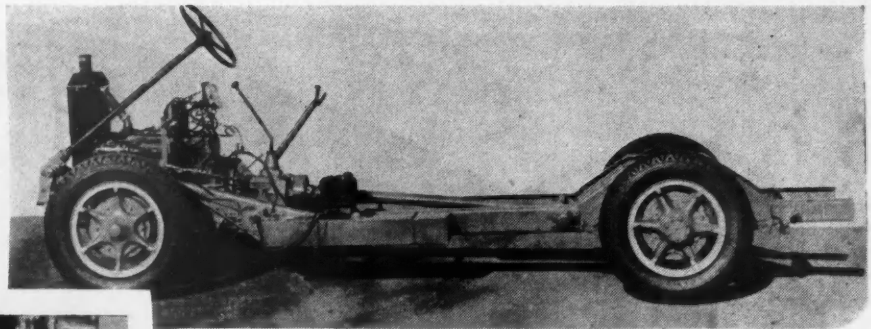
Practically all of the larger truck makers are experimenting with the new, small diesels. If you'll pardon a prophecy, we predict that by the end of 1936 all truck makers, with a few exceptions, will have diesel-engined models in their lines. We're not touting, heaven forbid, we're just telling.

#### And Lo, Big News!

Almost equal in importance to the new small diesel announcements in this issue (to which Waukesha will add an entry right shortly) is the still sub-rosa information that a highly reputable American automotive concern is in process of perfecting a diesel fuel injection pump. The resulting competitive situation is expected to have a decidedly slashing effect on this costly item in the diesel's makeup.

#### New Gas-Oil Converter

You may expect announcement soon of a new fuel oil burning device for attachment to gasoline engines. It comprises a heater with a syphon control valve that is said to maintain a constant temperature. The maker claims remarkable fuel economies.



Working with a Chicago department store, Available Truck Co. built this parcel-delivery chassis of close-coupled construction. The body, with floor 18 in. off the ground, will enclose the front and rear wheels to form a partial tear-drop design. The powerplant slides out the front on a sub-frame. Steering gear and foot pedals are mounted on the frame. The body builder will construct a tunnel over the driveshaft

#### A Diesel Oil Filter

For those now operating diesels, and those about to take the baptismal plunge, there is news in the fact that a leading accessory maker is about ready to market a fuel oil filter for diesel rigs. Said to be very efficient in removing all dirt and grit, it is expected to increase the life of fuel injectors and pumps and eliminate trouble-shooting between times. A check opposite "G" yonder will bring you advance dope from the maker.

#### Developments in . . .

In the 1936 line of one of our most prominent truck makers will be a four-cylinder half-tonner (or did we hear wrong) and a camel-back job.

#### . . . Gas-Engined Jobs . . .

The Mack company, in case you're the only person not in on the secret, will bring out a line of Mack Junior models. Reo will make them to Mack specifications and for Mack only.

#### . . . Proceed Apace, Egad

And our Mid-Western scout (that should just about enable you to put your finger on the plant in question) reports that about the time the New Year is being rung in, one of our important manufacturers of heavy-duty trucks will ring in a line of improved and retailored models, including eye-appealing front-end, fenders and running boards.

#### For Mechanical Brakes

The Logan Gear Co., Toledo, has taken over production and sale of the Vickers hydraulic equalizer for mechanical brakes. It gives hydraulic brake action at modest cost to cars and trucks with mechanical brakes. We hope to give you full details next month.

#### Another Gas-Oil Converter

A large engine builder is perfecting an attachment that makes possible a thermo-

controlled, automatic switch-over from gas to fuel oil.

#### Priming on a Primer

DuPont has a new primer which, in addition to superior adhesion, is said to have filling qualities. The adhesion holds good even on metals heretofore classified as difficult to finish, such as non-spangled galvanized steel and other non-ferrous metals. Add a four-hour drying period to these qualities and you have Preparakotem its trade name.

#### That Barrel-Shape Bearing

The new Chevrolet trucks will feature a barrel-type bearing, the result of 12 years' research by Hyatt. It is self-aligning and has the unique ability of taking both radial and thrust loads and of increasing its capacity as the load increases.

#### FREE (XMAS GIFTS) FREE

(Check and mail, not to Santa Claus, but to The Editor, Commercial Car Journal, Philadelphia, Pa.)

- ☐ A—I Drive Safely—64 pp. book
- ☐ B—The Truth About Motor Oils (48 pp.)
- ☐ C—Brake Service Manual (32 pp.)
- ☐ D—Chart of Lighting Equipment required by State Laws
- ☐ E—Sales & Service Manual Midland Christensen Vacuum Brakes (46 pp.)
- ☐ F—Standard Spark Plug Catalog (16 pp.)
- ☐ G—Advance dope on Diesel Oil Filter
- ☐ H—Send Aluminum dope (see p. 21)

Name.....

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No. Trucks Operated.....No. Cars.....





# Fleetmen Are Cranks On

**Survey Among Large Fleets Shows 65 Per Cent of Operators Put Oil Through Chemical Tests and Nearly 50 Per Cent Buy On Specifications**

**A** COMMERCIAL CAR JOURNAL survey on engine lubrication among large fleets shows that:

Nearly one-half of the fleets buy oil on their own specifications and two-thirds of those that do, find that a standard grade of oil coincides with their requirements.

About two-thirds of the fleet operators check the oil that is delivered by periodical analyses.

There is a definite trend toward the

use of lighter oil, but the question of draining interval remains a very confusing one with very little standardization of practice or similarity of thought. The 1000-mile drain leads other periods slightly but not enough to be conclusive of anything.

Oil filters are gaining but the fleet

without them can by no means be considered an exception.

More than one-half of the fleets check oil performance by getting the drainings analyzed and about one-half of the fleets reclaim drainings.

About 10 per cent of the fleets use colloidal graphite.



HERE are the questions on Commercial Car Journal's lubricating oil survey answered by 84 fleets operating 17,616 trucks and 6274 passenger cars for a total of 23,890 vehicles.

1. Do you purchase lubricating oil on your own specifications?
2. Is it a standard commercial grade?
3. Do you periodically get new oil analyzed?
4. What viscosity is used in summer? In winter?
5. At what intervals do you drain oil?
6. Are your trucks equipped with oil filters?
7. Do you periodically get a chemical analysis of crankcase drainings?
8. Do you reclaim drainings?
9. How do you use reclaimed oil?
10. Do you use colloidal graphite?

This article analyzes the fleetmen's answers in detail.

that the fleets participating do think for themselves and to a remarkably high degree base their decisions on analyses and tests. It is possible to get some idea of how exacting fleets are as oil purchasers by the answers to the first question: "Do you purchase lubricating oil on your own specifications?"

Thirty-one fleet operators replied "yes" to this question, leaving 53 operators who do not set specifications for the oil that they buy. If so large a portion of the fleets actually buy on their own specifications, it seems safe to assume that those who do not, go into the subject deeply enough to assure themselves that the vendor's specifications fit their respective requirements.

Only 10 of those fleets who buy on their own specifications find that no standard grade of oil meets their requirements. These 10, of course, as a result buy a non-standard grade of oil. The other 21 who buy on their own specifications buy a standard grade of oil that coincides with their specifications. The 53 who do not buy to their own specifications find the standard grade best fitted to their needs and buy it. This means in the totals column that 74 of the fleet operators buy standard grades of oil and 10 do not.

**F**LEET operators do not let the matter rest once they have bought oil. Fifty-seven fleets indicated that they periodically get a chemical analysis of the new oil that they buy. Only 27 fleets do not get this analysis. Of the 27 one states that he does not feel that he has enough trucks to go so deeply into oil, and two fleets lament the fact that their fleets are so widely scattered (TURN TO PAGE 91, PLEASE)

# Crankcase Oil

The average fleet vehicle consumes or renders unfit for further use, in the opinion of the fleet operator, 24.44 gal. of oil per year.

Eighty-four fleets, operating 17,616 trucks and 6274 passenger cars for a total of 23,890 vehicles, participated in the survey and 62 of them included in the information the amount of their annual oil purchases. The questionnaires were sent to large fleets only because it was felt that the larger fleets

were in better position to experiment with lubricants and consequently to do some independent thinking on this particular subject.

The amount of oil purchased by the 62 fleets is the basis for the consumption figure. The fleets purchase annually 373,740 gal. of lubricating oil for the operation of 7848 trucks and 3352 passenger cars. The total is 11,200 vehicles.

Returns to this survey indicate

# A Comparison of Diesel and Gas Operating Costs

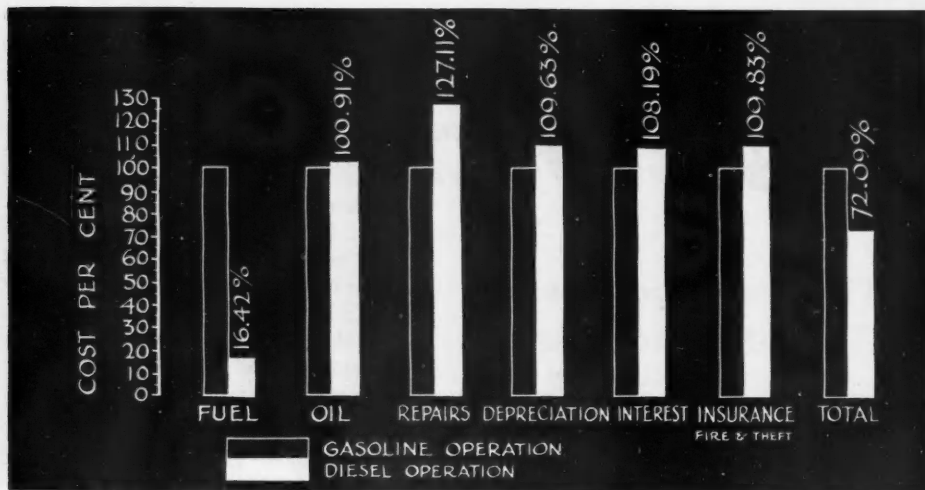
**A Study Made by Pacific Freight Lines with Trucks Operating Under Similar Conditions Reveals That Diesel Economy for the Present is in Low Fuel Cost**

**By C. G. ANTHONY**

Vice-president, Motor Freight Lines,  
Los Angeles, Cal.

**T**HE ultimate goal of all transportation policy is to furnish the people the transportation service which they require in the cheapest and most efficient manner possible.

This principle is, of course, derived from the economic premise that, in the long run, the wealth of society depends upon the efficiency with which natural resources, labor, and capital are utilized



Comparative chart of diesel and gasoline engine operating costs. Itemized tables are on other pages

—whether in the production of food-stuffs and raw materials, in manufacturing processes, or in the rendering of transportation services. When we have cheap transportation, we have one of

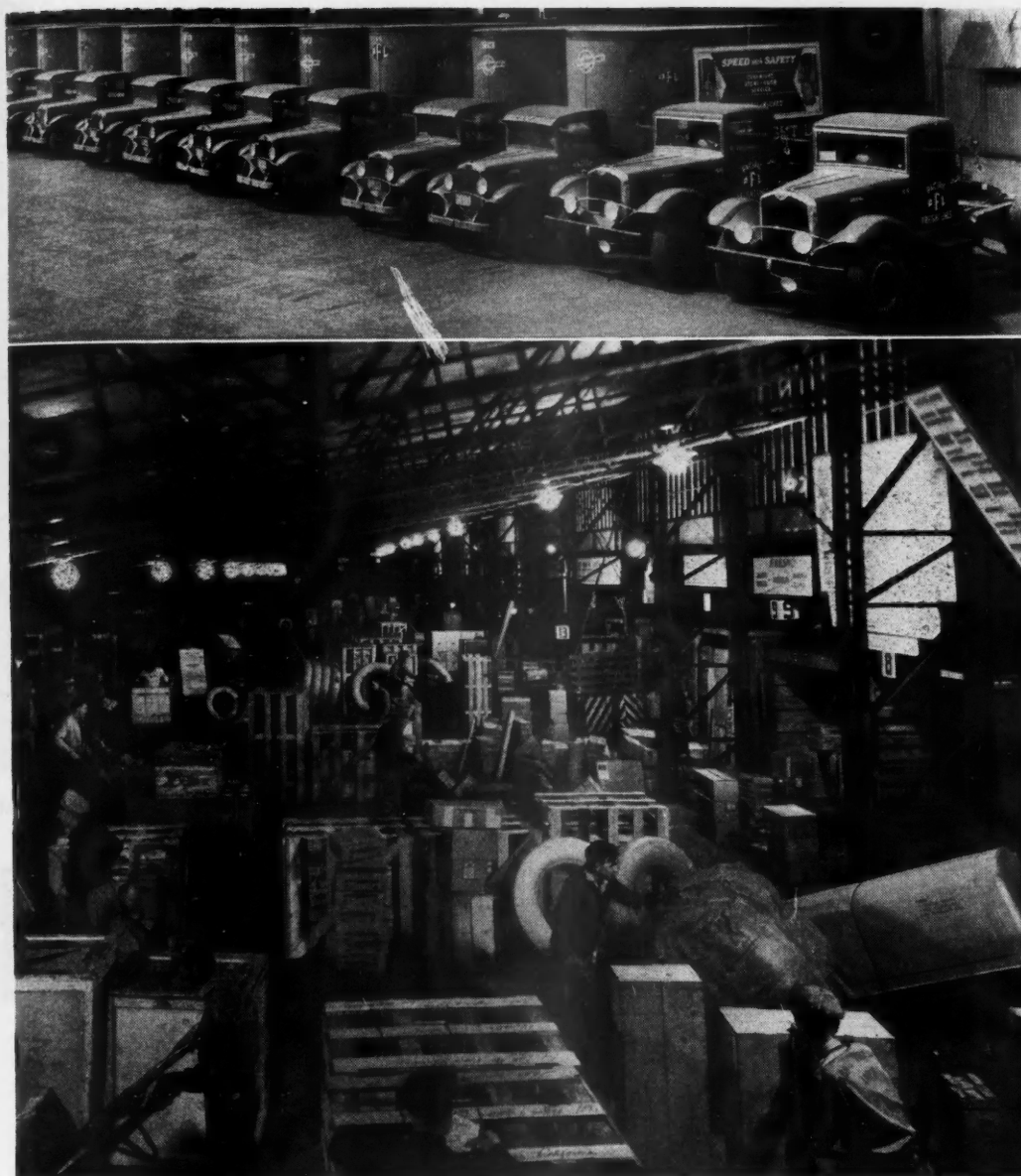
the vital elements of prosperity, because prosperity is the condition that exists when there is a profusion of goods widely distributed among the populace.

Where can the high-speed automotive diesel engine further the effect of this economic principle? Through this agency, can cheap transportation be furnished the people? What are the



Top—A portion of the Pacific Freight Lines' Los Angeles pick-up fleet at the receiving side of the terminal. Five trucks on extreme left are Diesel equipped and are on routes of from 100 to 260 miles each night. Above—The terminal platform showing freight moving across from pick-up-fleet on the left to line-haul trucks on right





pounded above, a careful audit and study were made of the operating experience of Pacific Freight Lines, probably the largest trucking concern operating any appreciable quantity of diesel-powered equipment in the United States. Pacific Freight Lines operates throughout the territory lying between Fresno, Calif., on the north and the Mexican border on the south—with an extensive operation, in addition thereto, between Los Angeles and Arizona points. In this territory, there is a wide variation in operating conditions. In the main, the operations are all over primary highways, but numerous grades are encountered—and temperature conditions range from the intense heat of the Mojave Desert and Imperial Valley to

costs of operating this equipment, and how do they compare to the costs of operation of the gasoline-motored equipment? Does the automotive diesel have inherent advantages over the gasoline motor; and, if so, what are they?

These are the questions that must be answered before the economic value of this type of diesel can be ascertained.

**DUE** to the lack of proper data and cumulative experience, little material of real value has been published on the subject. The manufacturers of the automotive diesel are rather lavish in their claims for their products, and the owner and operator of diesel equipment speaks of remarkable performance and great economy of operation—often without adequate information upon which to base a sound conclusion.

The purpose of this article is to develop conclusions from adequate known facts. Without such facts, conclusions

**T**HIS paper presented at the American Petroleum Institute convention in Los Angeles, develops from actual cost figures the relative cost of operating diesel-powered, heavy trucking equipment, as compared to like equipment which depends upon gasoline engines for power.

The conclusions show that the economy of a diesel-powered motor truck at its present stage of development is the result of its low fuel consumption, and the relative cheapness of the fuel used.

Due to the fact that this saving in fuel cost is so large, the paper shows that the cost of operating heavy trucking equipment can be reduced very substantially when diesel engines are used.



are mere guess work—and guess work is the apex of uselessness.

In order to gather and tabulate sufficient data from which to formulate direct answers to the questions pro-

the moderate temperatures encountered in the operations between the cities lying along the Pacific Ocean, between San Luis Obispo and San Diego.

The main fleet of Pacific Freight Lines consists of 75 trucks equipped with diesel motors and several hundred equipped with gasoline motors. From this large fleet it was possible to pick for this study 20 Sterling trucks, of the same design, operating under the same conditions, same gross-weight load factor, and in the same territory. They were all FC-135 models, having three axles, ten tires, chain drives, auxiliary transmissions, and equipped with air brakes. Ten of the trucks were powered by Cummins diesel six-cylinder motors; the remaining ten were equipped with Waukesha, model "AB," gasoline motors. Each of the 20 trucks pulled, at all times, a six-wheel trailer; and under loaded conditions, the total

(TURN TO PAGE 38, PLEASE)



This switching-trailer operation is possible by a standardization of equipment

SEMI-TRAILERS are well known for their contribution to greater operating efficiency. That's not news. But when two completely independent motor freight haulers standardize on trailers, and arrange for a cooperative switching operation that enables them to solicit more freight for delivery in each other's territory—that's news. And here is the news—the story of a cooperative trailer switching operation that has worked successfully for four years.

## They Switch

**T**WO trucking companies that are financially independent and have no interlocking ownership have eliminated time and labor of unloading and loading goods for trans-shipment to destinations beyond the sphere of either company's operations. The two companies are the Pyramid Motor Freight Corp., New York, and the Consolidated Motor Lines, Inc., Hartford, Conn. The elimination of these costly and inconvenient steps is made possible by switching the semi-trailers from the tractors of one company to the tractors of the other at a terminal located adjacent to each company's territory. Extraordinary co-operation is the only relation of one

company to the other. The Pyramid Motor Freight Corp. operates between Philadelphia and New York with service to all intermediate points and terminals at important points. The Consolidated Motor Lines, Inc., performs this same service between New York and New England with essentially the same type of organization. With the trailer switching arrangement, the Pyramid Motor Freight Corp. is able to solicit New England shipments in its territory and offer direct service with all of the facilities and equipment of the Consolidated Motor Freight Lines, Inc., in completing the shipment. The Consolidated line likewise is able to solicit shipments in New England for points as far south as Philadelphia and put the equipment and personnel of the Pyramid Motor Freight Corp. at the shipper's disposal.

**P**REVIOUS to 1932, both of these companies had been accepting such shipments as came their way for each

other's territory and hauling these shipments into New York where they delivered them to a foreign freight platform with a prayer for their safe delivery. After some experimenting with various carriers they started using each other's facilities almost exclusively for reshipments and each found the other to be as satisfactory as possible under the circumstances.

Along towards the end of 1931 representatives of these two companies got together to see what could be done towards establishing a through service. Much to their pleasant surprise they found in comparing notes that both were contemplating the purchase of new equipment immediately. The idea lurking in the back of all of the interested minds, that of standardizing on equipment and switching trailers, became a possibility. Careful thinking did not uncover any reason that would prevent the operation and so the two companies decided to try it.

Before new equipment could be purchased, however, it was necessary to agree on trailer capacities so that the



These operators standardized on Fruehauf semi-trailers with fifth wheels

# Trailers and Scram

## The Unusual Operation of Two Independent Motor Lines That Standardized On Trailers and Arranged to Switch Them Cooperatively

By HENRY JENNINGS

new tractors would pull the load satisfactorily. Then the clearance height at all bridges and underpasses had to be considered so that Pyramid trailers would clear Connecticut underpasses and Consolidated trailers would clear New Jersey bridges. With these things out of the way the scrutiny turned to brakes and with both companies favoring air as a means of brake application they both worked towards complete standardization on air brakes. However, the new tractors are equipped to handle air or booster-actuated brakes.

An agreement upon the use of a socket simplified the problem of connecting the source of current in the tractor to the lights on an alien trailer to a mere twist of the wrist, and a few hours in the shop qualified all trailers to meet new clearance light regulations in the new states. New fifth wheels are supplied to both companies by the same manufacturer and are identical. The Connecticut law requiring directional signal lights was new to Pyramid but the Pyramid shop and purchasing agent soon took care of that.

The insurance companies balked a little but not too much and were persuaded to cover the operation until such time as they had proof that it would not work. At this writing the insurance companies no longer view the switching of trailers between these companies with suspicion as this practice has brought them no new or weighty problems. The policies of each company carry the indorsement of the other. The trailers are insured by the policy that covers the tractor that is pulling them. Concealed losses are paid by both companies on a basis determined by mileage of the shipment on each line. Where the origin of loss can be established, the company responsible for the shipment at the time of loss must foot the bill.

Revenue is likewise decided on a mileage basis and this has brought no complications in clerical work. This part of the work flows as smoothly as if there were no switching of trailers.

All of these factors had to be given careful thought before a trailer could  
(TURN TO PAGE 40, PLEASE)





Hauling a 30-ton steel girder up Michigan Boulevard, Chicago, with 22 horse(es) power was an event of great importance to Pennoyer and Chicagoans in the 1890's. Since then the company's trucks, with heavy loads, have become a familiar sight in that city's business district. Right—View of downtown Chicago by Chicago Aerial Survey.

# Delivering Skyscrapers By Truck

**The Interesting Story of How the Pennoyer Co. Played Stork to Chicago's Skyline With a Specialized Trucking Service Hauling 90 Per Cent of the Steel for the Skyscrapers of Chicago**

**By H. H. SLAWSON**

**T**HE growing pains of a great city might not, at first thought, seem to bear any direct relation to the trucking business. But for over three-score years the struggles of the nation's second largest city, Chicago, to express itself in skyscrapers, have been the meat and drink whereon the Pennoyer Merchants Transfer Co. of that city has prospered.

In the whole field of truck transportation probably nowhere else can a more striking example be found of a concern as continuously and intimately a part of a community's constructive and cultural life.

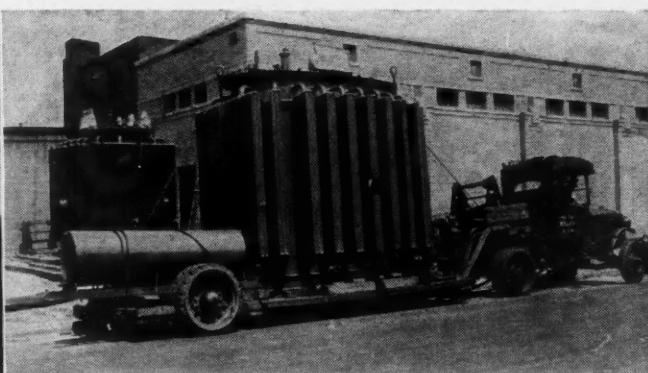
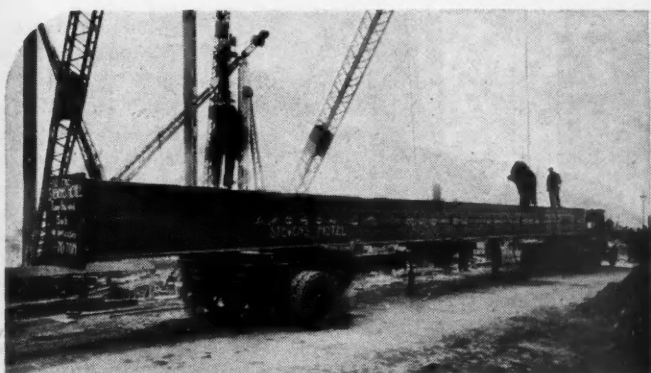
If a coat of arms were ever wanted by the Pennoyer people, the fabled phoenix bird of ancient mythology

would seem a most appropriate symbol to include in the design. Like the phoenix bird, the Pennoyer company sprang from a heap of smouldering ashes. For it was in the ashes of Chicago's great fire of 1871 that James C. Pennoyer, a Civil War veteran in search of a living, saw an opportunity. In the winter following the fire, Pennoyer purchased a team and cart and started in to haul ashes, of which there was plenty.

After the home town had been cleaned up a bit, he began hauling lumber for the new buildings that were springing up all over

**W**HEN Chicago went up in flames in 1871, the event marked the beginning of the flaming rise of a trucking company that chose not to fiddle because Chicago burned. James Pennoyer's idea, fired by the flames of that city's fire, was that a specialized service of hauling heavy building materials was much in demand in a city whose new growing pains manifested themselves in rising steel skyscrapers. Here is the story of Pennoyer's three-score years of specialized trucking while Chicago grew.





Above left—This 70-ton girder for the Stevens Hotel was hauled through a mile of Chicago's congested streets without a hitch. Above—Hauling a huge transformer was just a routine job for Pennoyer



the burned area. Construction methods in three-score years have changed a lot. Lumber gave way to brick and tile. Steel and concrete came into vogue, but the Pennoyer company is still hauling the raw materials out of which a city is fabricated. Today, as E. E. Koepke, treasurer of the company, puts it, "Ninety per cent of the structural steel in Chicago's loop district—the downtown business area—was hauled to position by the Pennoyer Merchants Transfer Co." And in the intervals between the episodes of this program the company has busied itself in moving a strange assortment of ponderous objects ranging from electric generators to monuments in the public parks.

**MR. KOEPKE**, who became an active executive of the concern when it was reorganized following the founder's death in 1920, insists that it's "a rather unique business."

"It's always interesting," he says, "and lately Chicago's expanding metropolitan ambitions have caused complications that keep us more than ever on our toes."

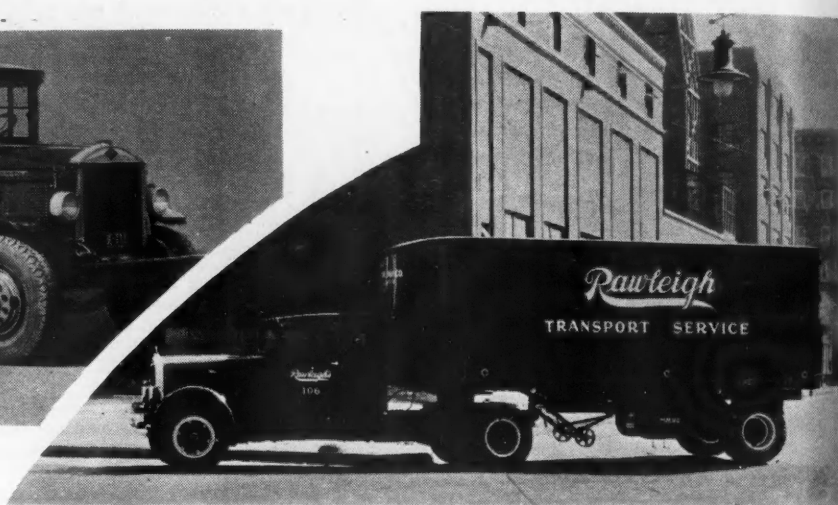
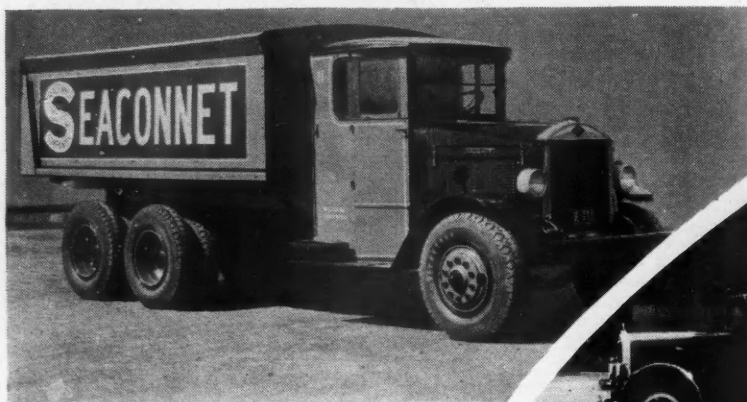
"Back in 1872 when Mr. Pennoyer was hauling two by fours for the wooden shacks of the post-fire period it was a vastly simpler job than that which we face in helping to erect the 40 and 50-story skyscrapers of the present. To get a steel beam from the railroad flat car to its position as part of the skeleton of some new structure is a task that must be planned as carefully as a general maps out his battles. And we do have battles—not physical, it is true, but calling for expenditure of tremendous nervous energy and the exercising of a high degree of painstaking care."

"When we haul a big steel beam through a downtown street in Chicago today it is a matter of vital interest to a large number of people. The contractor erecting the building has to have it at a definite moment, or else he'll have some high-priced workmen eating up his profits while they idle around. Show folks with their slogan, 'The show must go on,' have nothing on us. For us, the girders *must* get through and that doesn't mean maybe."

"But there are a surprising number of other interests that cannot be interfered with without

(TURN TO PAGE 87, PLEASE)





# Fleets Find Aluminum

**S**EVEN years ago a new chapter was added to the eventful history of the truck industry with the building of the first aluminum truck body. Since then, aluminum as a truck body material, with its tremendous weight-saving advantages, has continued to gain converts among fleet operators, until today it is represented in practically every vocation.

This light-weight metal, whose virtues are universally recognized, has overcome tremendous obstacles. One of these was the mistaken idea that being light, it could not be structurally strong. Time and experience have dispelled this impression. Another was the belief that its greater cost made it economically unpractical. Time and many experiences, a selected number of which are the real reason for this article, disprove that also.

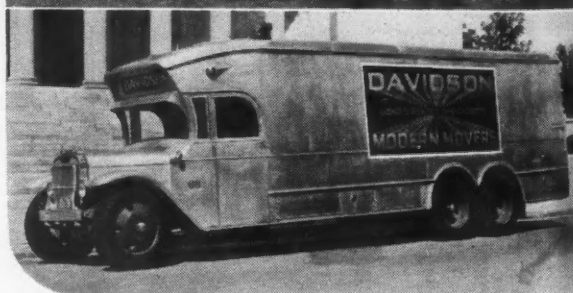
The alloys which have been developed are practically as light as the parent metal but are considerably stronger. Wrought alloys are used almost to the exclusion of cast alloys in body construction. Heat treatment and aging are used in arriving at desirable alloys for truck body construction. These alloys are designated by digits and letters and it is highly possible that as many as six different alloys are used in one aluminum body, each having some characteristic that makes it desirable for a particular location.

There are three ways to realize profits from the investment in aluminum alloy bodies. One is to replace a heavier body with an aluminum body of the same size. The same truck will then carry the same payload at greater speed but with less fuel and oil consumption. Another is to replace a chassis carrying a heavy body with a lighter chassis equipped with an aluminum body of the same size as formerly, in which case the return is immediate, the saving in chassis cost being more than the increase in body cost

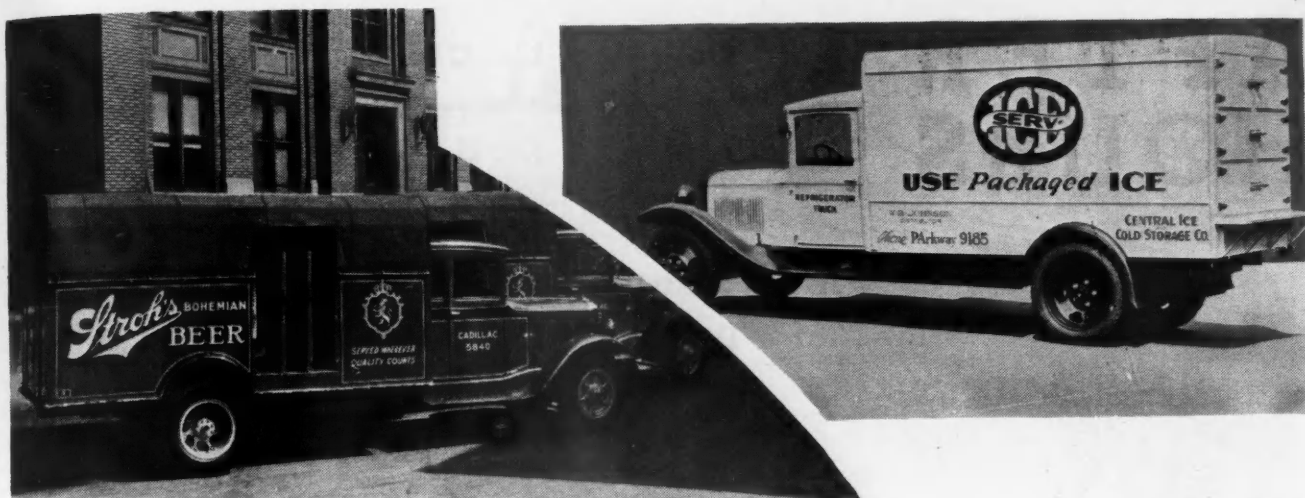
**Operators' Experiences Show That With Lighter Metal You Can Cut Yourself a Bigger Slice of Payload Cake or Cart Same Loads at Lower Cost**



Illustrations on these pages are of some of the various types of aluminum bodies in use by different truck-using vocations. Details regarding what these operators gained by using aluminum bodies are given in the story





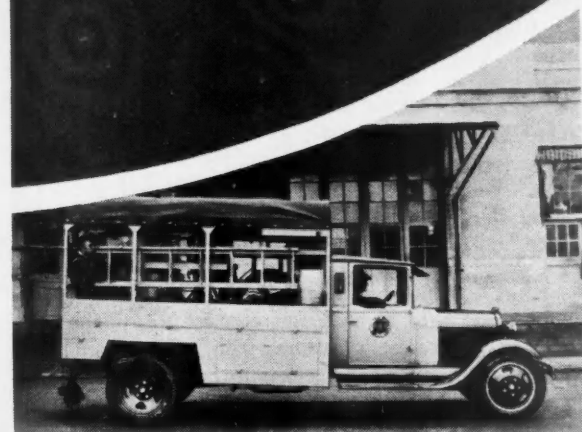


# Pays Off in Payloads

NOT enough has been said about aluminum bodies to give a convincing explanation of what is to be gained by using aluminum. The important questions are: How much weight can be saved?; how much money can be saved?; how strong is aluminum construction? The purpose of this article is to answer these questions, not with academic arguments, but with the experience of fleet operators representing various truck-using vocations.

and the rest of the saving is realized over a period of time in the form of fuel and oil savings.

The third and most common practice is to replace the dead load with payload. For most cargoes, the aluminum body can be made considerably larger than a steel body and at the same time lighter so as to permit hauling more payload at no increase in gross load. Ten or 15 per cent is not an unusual saving in body weight. An aluminum body often furnishes a convenient means of hauling more payload when a legal gross load limit is in effect.



If you are interested in obtaining additional information pertaining to the use of aluminum for truck bodies in your particular vocation, check "H" in the free offers on page 11. We'll see that you get it pronto or quicker

BY far the most effective way of saving weight in a semi-trailer is to use aluminum alloys in a monocoque or chassisless design. Monocoque construction is based on designing the body on the principle of the box girder, in which the panels as well as the uprights and longitudinals carry the loads. Thus the chassis is eliminated and the body, instead of being merely a shelter for the payload, is a structural member in which every pound of metal is made to carry its share of the load. Monocoque construction is almost universally used in modern all-metal airplanes and its principles have been recently incorporated in a number of light-weight truck bodies. In one case an entire chassisless aluminum semi-trailer unit weighed less than the steel body alone of the unit it replaced.

Aluminum bodies when worn out have a high scrap value and during their life they hold paint well. In addition to being compatible with paint they are highly corrosion resistant.

Facts gathered from the operators of trucks with aluminum bodies provide history from which any operator can draw his

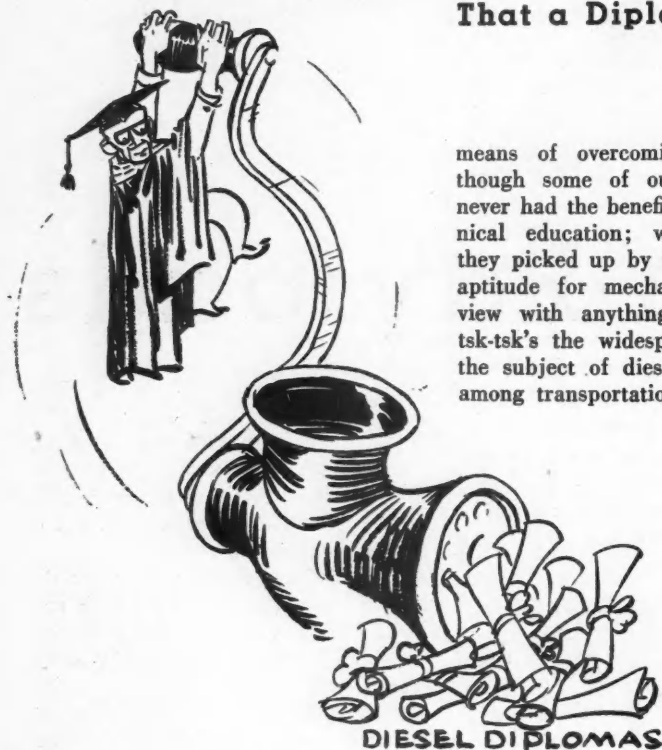
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# AFTER HOURS

Editorial Comments By

George T. Hook, Editor

## Airing Justifiable Annoyance With the Notion That a Diploma Is Necessary to Handle a Diesel



**T**HERE'S quite an assortment of newsy material on diesel engines in this issue, and it reminds us to ventilate our pet peeve. This is as good a time as any to get it off our chest. And a lot of good it may do, we hope you'll hope.

So, at the risk of offending some very nice people, we want to go on record as deploring, with appropriate thumps on the desk, the emphasis that many schools are placing on special schooling as an absolute requirement for handling diesel engines. And more thumpingly do we deplore the fact that certain diesel manufacturers have added weight to the emphasis by permitting their names to become associated with certain schools.

We have no bones to pick with the schooling that is being offered, although we hear that some of it is pretty trivial. Nor is it any of our business that some schools are too freely holding out the bait of lucrative positions to graduate diesel mechanics, although that is clearly unethical because the promises cannot be fulfilled. Nor do we object to formal educational processes as a

means of overcoming ignorance, although some of our best mechanics never had the benefit of a formal technical education; what they learned they picked up by virtue of a natural aptitude for mechanics. Nor do we view with anything but depreciating tsk-tsk's the widespread ignorance on the subject of diesels, prevalent even among transportation men whose positions require them, in the interests of their employers, to be wiser.

Frankly, we're not annoyed by the big rush of schools from coast to coast to cash in on the public's curiosity in diesels. That's

a natural development, although we believe the schools will be sorely disappointed in the response. What does annoy us, and what we do deplore, is the unwholesome effect of their combined advertising efforts which, in our opinion, has been to give the public a feeling that the diesel is a modern mechanical mystery requiring a special course in hocus-pocus to master it. The fear has penetrated even into the fleet field.

**T**HIS matter has been the object of public inquiry and private discussion by your annoyed correspondent and, right from the diesel trenches, he is privileged to report that to the claim of special schooling and to the surrounding air of mystery the emphatic, if somewhat proletarian, answer is a soul-satisfying "Nerts!"

Diesels are not the complicated or mysterious mechanisms the school-masters would have you believe. So far as the fleet field is concerned we venture the statement that there is not a competent mechanic in its fold who, exposed to a diesel, could not care for

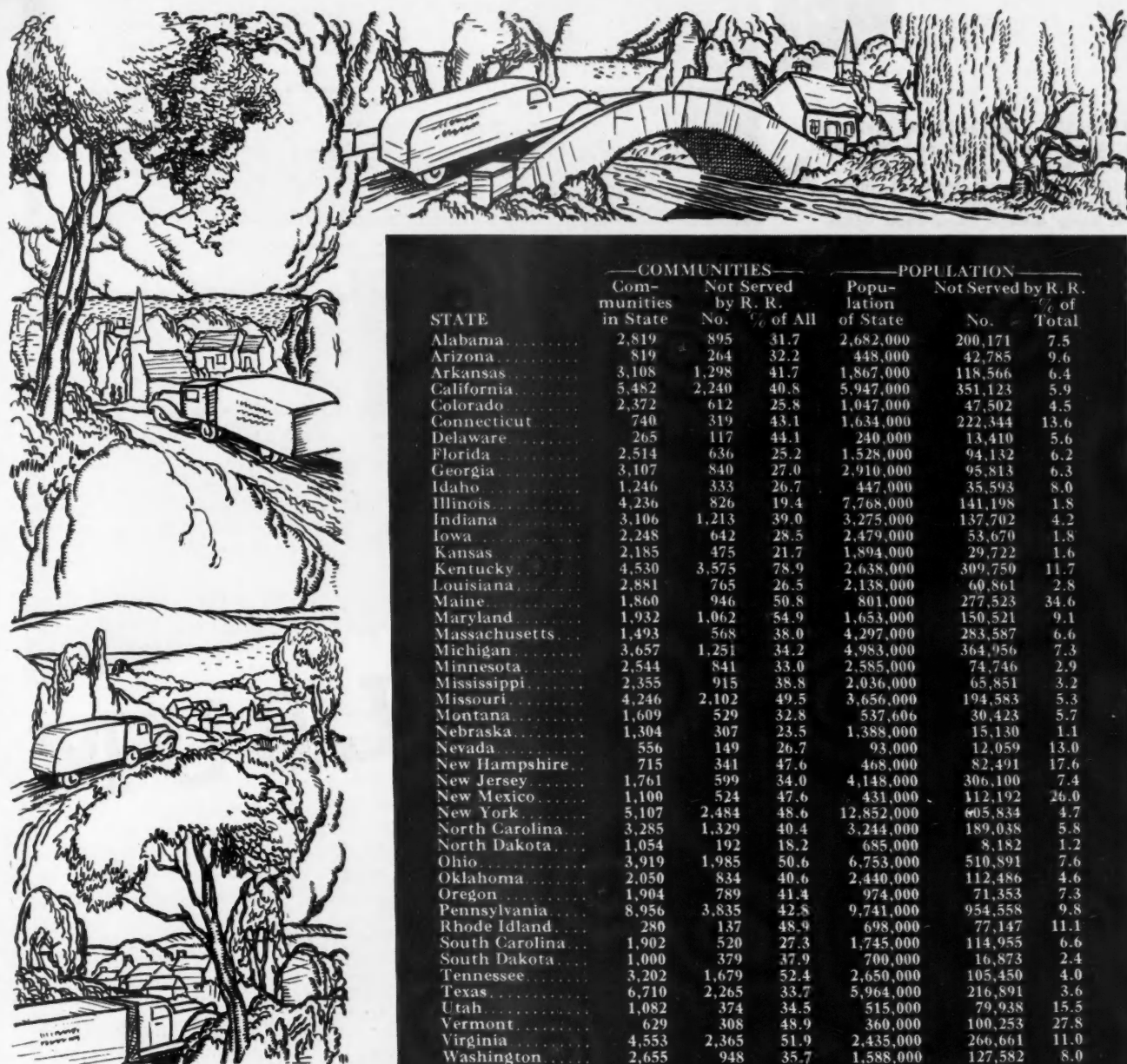
it effectively merely by applying himself faithfully and following the instructions of the manufacturer. Has knowledge of gasoline engine maintenance been gained in any other way?

Did the western fleets using diesels have to send their mechanics to college? Exposed to the problems they found the answers. Granted that there's a good deal of trial and error in such a system; but it's a system that even college-educated mechanics are compelled to resort to when they stack up against realities.

**T**HE dum-dum bullet that proponents of specially trained diesel mechanics usually fire to wind up their arguments is none other than the vital fuel injection system. "Show me an untrained mechanic," they say, "who can repair an injector that has gone sour." The answer to that one is that a mechanic, no matter how well trained, couldn't do a thing about sweetening the injector unless he had the equipment to do it with. And the equipment, we are told, is so specialized and so costly that no fleet will be able to afford its installation. So the repair of injection systems will remain, as is pretty generally true of electrical repairs today, the work of specialists. A replacement unit will keep the truck in operation while repairs are being made.

Now that this peeve is off our chest we feel another one coming on. It has to do with the skeptics who claim the diesel's future will be blighted the moment economics shoves fuel oil prices up to the level of gasoline. The fallacy of their reasoning is that they fail to consider that the same economics will have the opposite effect on the cost of a diesel and tend to lower the now high depreciation and interest charges. The diesel, giving from 50 to 100 per cent more miles per gallon, will still have an advantage attractive to operators seeking every possible penny of economy.

The diesel, unquestionably, will have a permanent place in the fleet field.



STATE	COMMUNITIES			POPULATION		
	Com- munities in State	Not Served by R. R. No.	% of All	Popu- lation of State	Not Served by R. R. No.	% of Total
Alabama	2,819	895	31.7	2,682,000	200,171	7.5
Arizona	819	264	32.2	448,000	42,785	9.6
Arkansas	3,108	1,298	41.7	1,867,000	118,566	6.4
California	5,482	2,240	40.8	5,947,000	351,123	5.9
Colorado	2,372	612	25.8	1,047,000	47,502	4.5
Connecticut	740	319	43.1	1,634,000	222,344	13.6
Delaware	265	117	44.1	240,000	13,410	5.6
Florida	2,514	636	25.2	1,528,000	94,132	6.2
Georgia	3,107	840	27.0	2,910,000	95,813	6.3
Idaho	1,246	333	26.7	447,000	35,593	8.0
Illinois	4,236	826	19.4	7,768,000	141,198	1.8
Indiana	3,106	1,213	39.0	3,275,000	137,702	4.2
Iowa	2,248	642	28.5	2,479,000	53,670	1.8
Kansas	2,185	475	21.7	1,894,000	29,722	1.6
Kentucky	4,530	3,575	78.9	2,638,000	309,750	11.7
Louisiana	2,881	765	26.5	2,138,000	60,861	2.8
Maine	1,860	946	50.8	801,000	277,523	34.6
Maryland	1,932	1,062	54.9	1,653,000	150,521	9.1
Massachusetts	1,493	568	38.0	4,297,000	283,587	6.6
Michigan	3,657	1,251	34.2	4,983,000	364,956	7.3
Minnesota	2,544	841	33.0	2,585,000	74,746	2.9
Mississippi	2,355	915	38.8	2,036,000	65,851	3.2
Missouri	4,246	2,102	49.5	3,656,000	194,583	5.3
Montana	1,609	529	32.8	537,606	30,423	5.7
Nebraska	1,304	307	23.5	1,388,000	15,130	1.1
Nevada	556	149	26.7	93,000	12,059	13.0
New Hampshire	715	341	47.6	468,000	82,491	17.6
New Jersey	1,761	599	34.0	4,148,000	306,100	7.4
New Mexico	1,100	524	47.6	431,000	112,192	26.0
New York	5,107	2,484	48.6	12,852,000	605,834	4.7
North Carolina	3,285	1,329	40.4	3,244,000	189,038	5.8
North Dakota	1,054	192	18.2	685,000	8,182	1.2
Ohio	3,919	1,985	50.6	6,753,000	510,891	7.6
Oklahoma	2,050	834	40.6	2,440,000	112,486	4.6
Oregon	1,904	789	41.4	974,000	71,353	7.3
Pennsylvania	8,956	3,835	42.8	9,741,000	954,558	9.8
Rhode Island	280	137	48.9	698,000	77,147	11.1
South Carolina	1,902	520	27.3	1,745,000	114,955	6.6
South Dakota	1,000	379	37.9	700,000	16,873	2.4
Tennessee	3,202	1,679	52.4	2,650,000	105,450	4.0
Texas	6,710	2,265	33.7	5,964,000	216,891	3.6
Utah	1,082	374	34.5	515,000	79,938	15.5
Vermont	629	308	48.9	360,000	100,253	27.8
Virginia	4,553	2,365	51.9	2,435,000	266,661	11.0
Washington	2,655	948	35.7	1,588,000	127,582	8.0
West Virginia	4,054	1,622	40.0	1,761,000	174,598	9.9
Wisconsin	2,615	970	37.0	2,976,000	166,045	5.6
Wyoming	736	293	39.8	229,000	21,270	9.3
TOTALS	122,473	48,492	39.6	124,328,606	7,844,509	6.3

**T**HE accompanying table of facts compiled under the direction of the Motor Truck Committee of the Automobile Manufacturers Association and printed in "Motor Truck Facts" reveals that 48,492 communities in this country with a population of 7,844,509 people are without railroad service and must rely on motor truck service for sustenance and contact with the outside world. This means that 40 per cent of all communities in the United States and 6.3 per cent of the population depend almost entirely on highway vehicles.

The survey represents the work of five persons working seven weeks and involved the checking of the Rand McNally Commercial Atlas (which contains a list of all communities in the country) against the communities for which railroad service is listed. Of the 48,492 communities without railroad service, 5492 are served by interurban

## 48,492 Communities WITHOUT RAILROAD SERVICE MUST Depend On Trucks

**Highways Are the Life-Line for 6.3% of U. S. Population Depending Entirely Upon Highway Vehicles**

electrics, practically all of them in passenger service. Not included in these figures is the population of 15,017 com-

munities whose population is unknown. Population figures are based on the Census Bureau estimate of July 1, 1932.



FRUEHAUF designed this striking semi-trailer for the Genesee Brewing Co., Rochester, N. Y., which uses it to frisk its special team of horses (this van carries five Belgian roans) from horse show to horse show where they are put through a parade and drill. By repeat trips this outfit usually handles 13 horses (12 in the show team, and one spare). Show places are close enough to permit this shuttling. The equipment advertises Genesee beer and ale; sound equipment in the "semi" helps. Fruehauf designed the drop-frame van with low center of gravity—providing greater safety and riding quality. Tractor is Dodge.

STERLING is the proud power at the bow end of this unit. A Cummins six-cylinder, 100 h.p. Diesel is under the hood. The tractor is model FD115H, 161-in. wheelbase. The Universal "semi" was built by Fitz-Gibbons & Crisp, Inc., and is insulated with Kapoc and lined with aluminum. The dry-ice refrigeration system is also a product of F.G. & C. Needham's Motor Service, Philadelphia, is the operator.

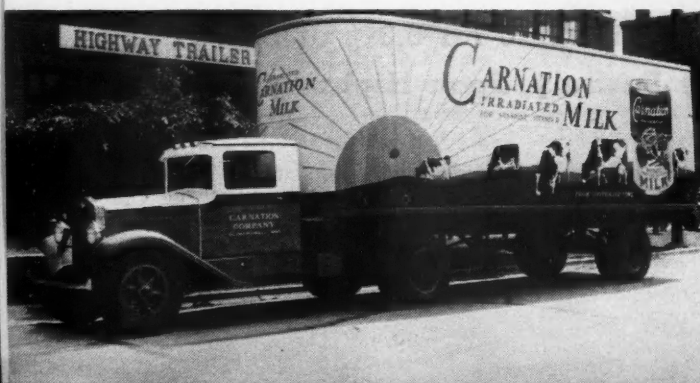
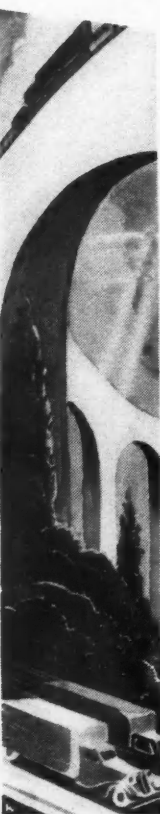
WALTER snow fighter trucks, like fire fighters, are always on the job, and this one will probably see plenty of service in the snow belt this winter. This Walter job is a model FQS four-point positive drive 3.5-ton chassis with a 110 h.p. engine. As you see it it is equipped with a dump body and hydraulic road scraper blade.

DRY ZERO SEALPAD was used as insulation to keep out the heat and keep in the cold—or vice versa (bottom right) in this refrigerated body built by Bode-Finn, Inc., for the Kroger Grocery & Baking Co. Minimum weight was achieved by using aluminum panels inside and out. There are doors in the rear and side. The body rests on its laurels—and a Ford chassis.

HIGHWAY TRAILER has a place in the sun with this job furnished to the Carnation Milk Co., at Aconomowoc, Wis. It is a model 77-B with an over-all length of 25 ft.; width is 8 ft. and height 7 ft. The body is veneer lined and has an aluminum roof. The nose is round. The tractor is a Mack. Carnation, like its cows, may well be content with this really striking "semi" whose sides are used to full advantage for advertising display.



# The ALBUM



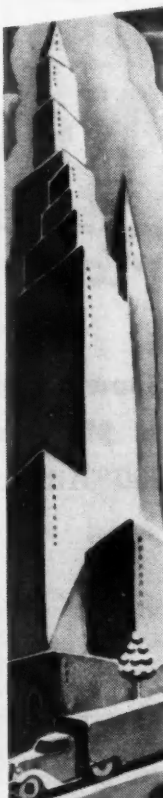
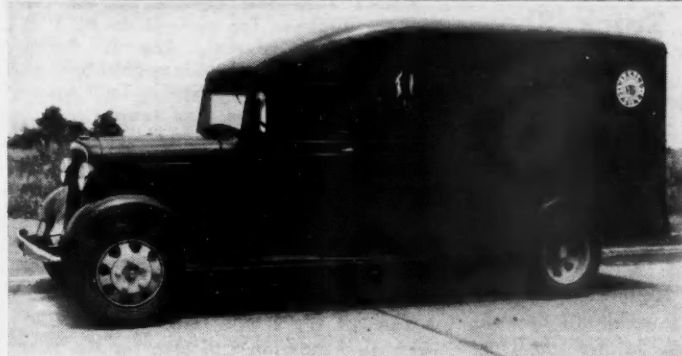


**STUDEBAKER** breaks the ice with this modern ice delivery truck that just about freezes the old style ice truck out of the picture. This 1½-ton unit is operated by the Crown City Ice Co., Pasadena, Cal. The streamlined body has full cork insulation. The sliding rear door—it goes into the roof—is dust proof and assures the housewife clean ice. Note that the floor level makes things easy on the driver. Now, when will we have streamlined ice?

**BADGER TRAILER & BODY CORP.** built this attractive job for the Swanson Trucking Co., Manistique, Mich. The refrigerated Badger trailer is 26 ft. long and is insulated with Silvercote insulation. The de luxe equipped Autocar tractor is a UNT model.

**MET-L-WOOD CORP.** built this body on a GMC model T-16 chassis but the picture gives no idea of the great capacity achieved through its frameless construction. Roof rails curve decidedly in front. The rear flares below the floor line. Double doors are in the rear. Operator Visking puts on the "dog" with this unit used for delivering skinless frankfurters and sausage casings in Chicago.

## Of Modern Truck Transportation Equipment



A HUG tractor with Diesel engine supplies transportation power on this job (bottom left), the tanks of which were built by the Columbia Steel Tank Co. for the D & R. Transportation Co. of Michigan. When you see it coming, know ye that it is no mirage. The tanks each carry 4800 gal. Loaded, the outfit weighs 48½ tons. It rolls on 26 tires. It is claimed to be "the largest transportation outfit in the world."

THIS DIAMOND T model 352 chassis with 202-in. wheelbase, is equipped with a Truxmore third axle and narrow cab to provide for extra lengths of steel projecting forward. The body was constructed from steel fabricated by A. M. Castle, the operator. The floor is all steel. The tarpaulin rack and steel stakes are removable. Lettering is made of individual steel letters cut with an acetylene torch. The outrigger on the front-end supports extra lengths of steel.







## T-Men At Newark Air Developments

**Transportation Men Enliven Show Sessions With Discussions of Tires and Springs, Maintenance, Diesels, Regulation and Taxation; 11,000 Attend Truck Show**

**T**HE papers on diesel engines, preventive maintenance and tires and springs proved to be the popular ones at the S.A.E. sessions held in connection with the Motor Truck Show at Newark, N. J., last month. Not far behind was an analysis of the 1936 cars.

After a very keen analysis of the 1936 passenger cars and the new engineering developments by Austin M. Wolf, consulting engineer, Captain Gray, Shell Eastern Petroleum, voiced the opinion of fleet men present when, in discussing the paper, he said, "All of the present and new passenger cars

have too much engine and too many accessories to be good fleet cars."

At the diesel session a paper was read by T. R. Kelley, Waukesha Motor Co., in which Mr. Kelley stated positively that it was possible to operate diesel engines from idling speed to their governed speed without smoking if the engines were properly maintained. Mr. Kelley made clear that a smoking engine was simply evidence of incorrect maintenance and offered to prove his point at the conclusion of the meeting with a demonstrator that was being shown to show visitors.

At the conclusion of Mr. Kelley's pa-

per a lively discussion started as a result of a view expressed in the paper. Mr. Kelley said that he did not believe it was a sound idea to install a diesel engine in an old gas-engined truck because of the torque characteristics of the diesel engine and also for the reason that the drive line units of the old truck had never been designed for diesel power.

Ralph Werner questioned this viewpoint, saying that he failed to see the difference between one foot pound of torque and another foot pound of torque regardless of how it was developed.

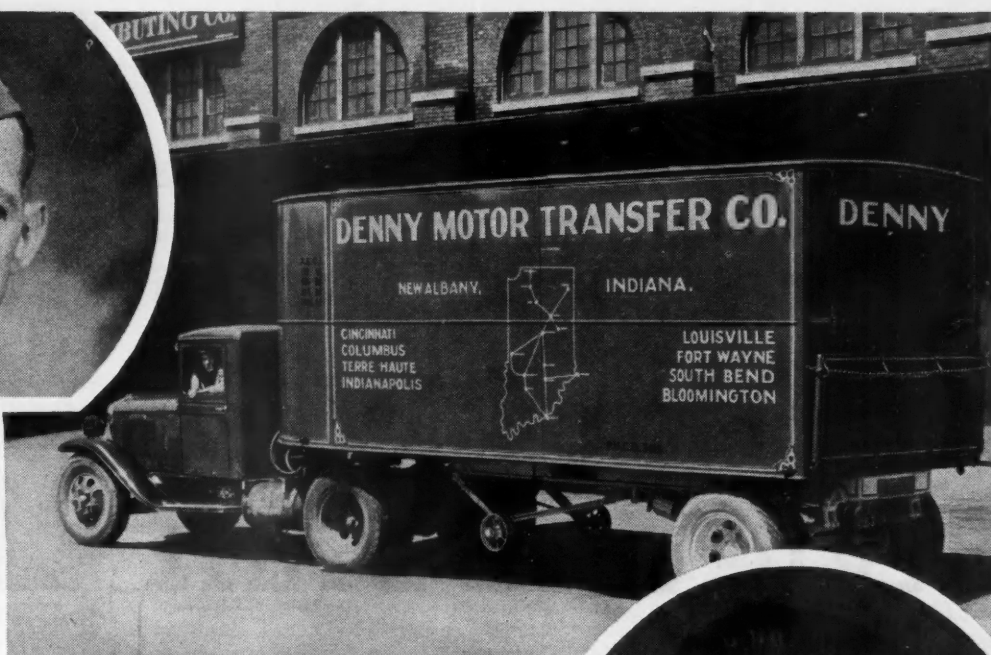
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Operator Denny . . . next to safety the Legion is a favorite hobby

Right—One of the modern semi-trailers which Denny operates in his overnight service



By **MERLE S. DENNY**, President,  
Denny Motor Transfer Company, Louisville, Ky.

## 2,000,000 Miles OF OVERNIGHT DRIVING AND No Accidents

**That is the Safety Record Achieved by Thirty-Nine Truck Drivers in One Year of Operation**

**T**HE safety record of our drivers is one of which the Denny Motor Transfer Co., Louisville, Ky., is justly proud. Those 2,000,000 miles of safe driving mean that each of the 39 drivers averaged 50,000 miles a year of no-accident driving. One of those drivers, Hollis Carroll, has been with us 14 years, has driven more than 900,000 miles for an average of about 65,000 miles a year, and has had only two minor accidents, neither of which was his fault.

What is this plan of safety operation that made it possible for our drivers to establish such an excellent safe driving record? It is based on (1) safety meetings, (2) safety committees, whose job it is to analyze accidents, (3) a bonus plan, (4) systematic driver se-

lection and training, and (5) preventive maintenance.

**A**S the success of a safety campaign depends a great deal on the material with which you have to work, we are careful in selecting and training our drivers. When we employ drivers we make a careful investigation of each man. A great many of them are known to us personally which simplifies matters, and those who are not, are carefully checked. They are then put on a probationary period as dock men, after which we give them a city truck under supervision. After serving time as city drivers, they are given road jobs according to seniority. Then they are under the supervision of an older driver who checks performance on the



Driver Hollis Carroll . . . 14 years and 900,000 miles of safe driving is his achievement

**T**HE safety plan of the Denny Motor Transfer Co., that made it possible for its drivers to achieve an enviable no-accident record, consists of (1) safety meeting, (2) employee safety committees, (3) a bonus system, (4) driver selection and training, and (5) preventive maintenance.

In this article Operator Denny tells, in terse language, details of his plan and how it operates in promoting safety.

road. We do not hire inspectors to check up on the men regularly, although if we are in doubt about a driver's actions on the road, he is then checked. We prefer to put them on their honor, as we do not feel like keeping employees who have to be watched at all times. The job is made attractive.  
(TURN TO PAGE 54, PLEASE)

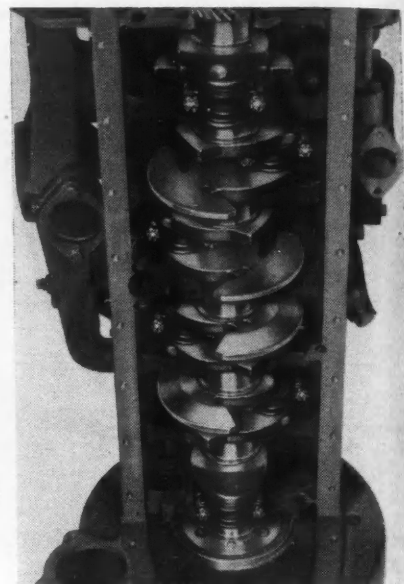
# Diamond T Line Sparkles With Style and Stuff

**T**HE Diamond T Motor Co. is featuring additional development of streamlined style, advances in load distribution, improved engine mounting and spring suspension, driver comfort and ease of handling in its 1936 line of trucks. Completely satisfactory experience with current engines, clutches, transmissions, axles, and brakes made it inadvisable to make any important changes in these major units in the new trucks.

A newly developed rubber engine mounting is used, resulting in almost complete isolation of engine vibration and shocks due to initial torque reaction. The new precision type main bearings available in only some models in the past are now standard equipment on all models. Another feature

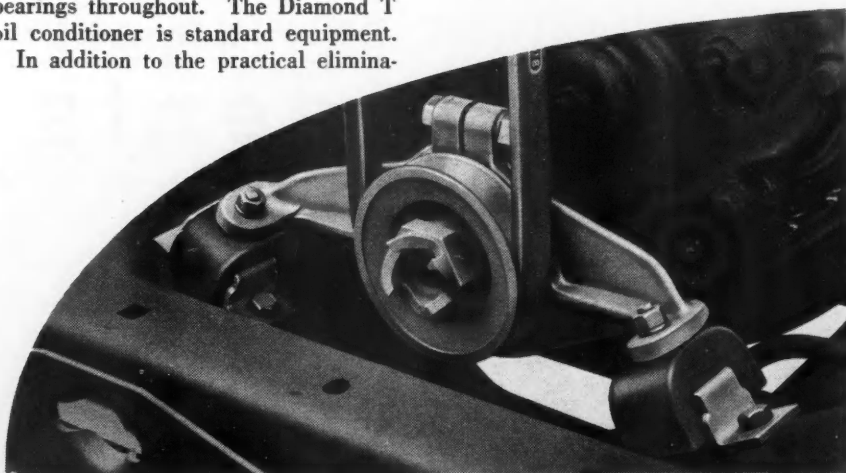
of the 1936 line is the provision for furnishing special super service engines as optional equipment for extreme service conditions. These engines have counterbalanced crankshafts of alloy steel, cadmium-nickel precision bearings throughout. The Diamond T oil conditioner is standard equipment.

In addition to the practical elimina-

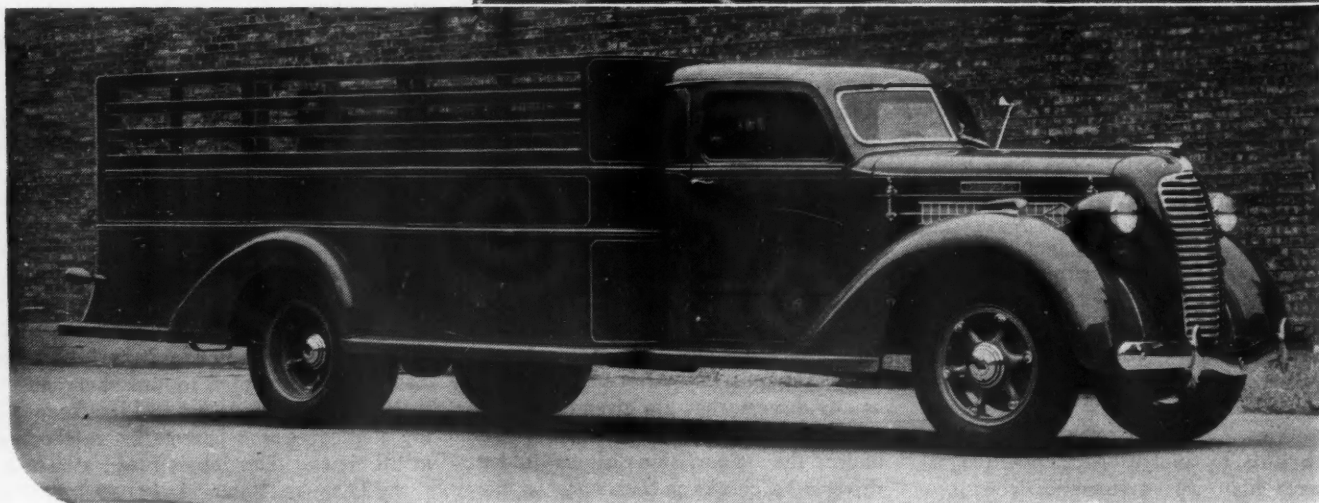


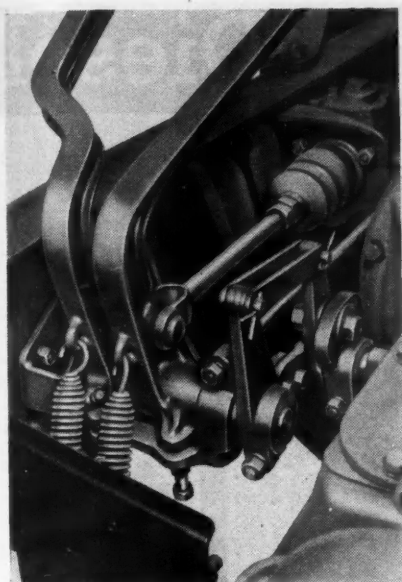
Counterweighted crankshaft in super-service engine

tion of engine vibration the new engine mounting provides for better payload space and better balance by bringing the engine forward more than 6 in. Frames have been completely redesigned and the wheelbase on models 212A and 228 has been extended from 135 $\frac{1}{8}$  in. to 139 $\frac{3}{4}$  in. to allow satis-



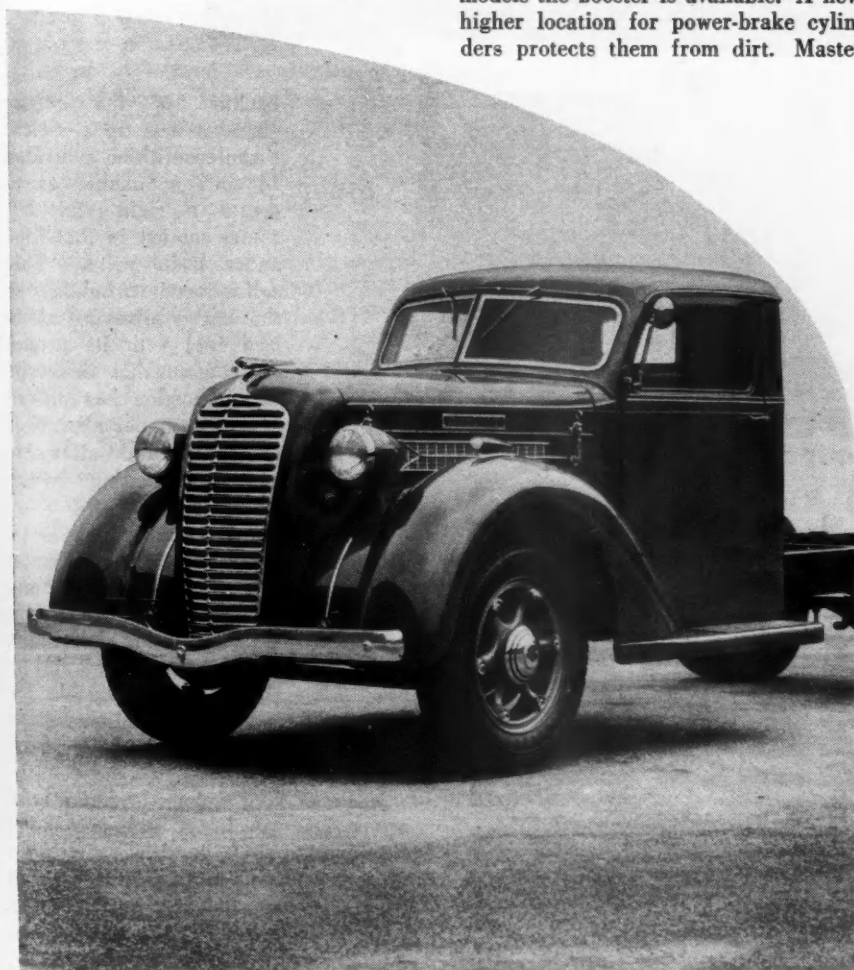
Right—New rubber engine mounting  
Below—Diamond T's new stake body  
on a 1936 chassis





Clutch and brake pedal are mounted on frame

factory weight distribution with a 9 ft. body. The new frames have been carefully worked out to give the necessary strength and stiffness without excess of weight. The shortest wheelbase frame is 8 in. x 3 in. x 3/16 in. In the intermediate wheelbases this last dimension is increased to 7/32 in. and to 1/4 in.



## Styling, Load Distribution, Spring Suspension, Engine Mounting and Other Mechanical Improvements Keep It In "Beauty With Brains" Class

Wider springs have been provided both front and rear throughout practically the whole line and an improved rear spring mounting unit has eliminated the last spring lubrication point. All front-spring shackles have compression-type rubber bushings as do the front shackles of rear springs. The rear ends of rear springs are free, supporting the frame on specially-designed brackets. The cam follower of the Ross steering gears is roller-bearing mounted to improve steering.

Hydraulic brakes with cast drums of generous dimensions are employed throughout. Eight-inch, external, contracting emergency brakes are used on the four smaller models and the others have the Tru-stop ventilated disc brake. Bendix booster is standard on all models except the 212 series and on those models the booster is available. A new higher location for power-brake cylinders protects them from dirt. Master

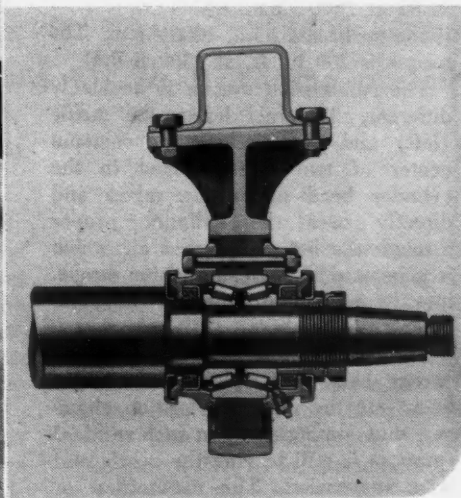
cylinders are now anchored solidly to the frame. Brake pedals are now carried on a frame bracket instead of the clutch housing, thus eliminating vibration of the pedal.

**PROPELLER-SHAFT** bearing-carrier is mounted in live rubber with a double Timken roller bearing instead of ball bearings for added quietness and longer life. Gasoline capacity has been increased to 30 gal. in a stronger fuel tank and increased use of leakproof and vibration proof flexible tubing and standardization of all gas lines and hydraulic line fittings cut maintenance.

The new de luxe cab has increased roominess and excellent visibility. The slope of the "V" windshield has been increased from 11 deg. to 30 deg. Adjustable seats and lazy back of finer quality add to the comfort. The battery cover is accessible through a battery cover in the floor boards. Standard de luxe cabs are now 60 in. wide and more foot room is provided by the 2 1/2 in. wider cowl. New skirted fenders are used and removable fender shields permit easy access for engine maintenance work.

Grille, cabs and fenders have been redesigned as a further development in appearance. De luxe models are trimmed in chromium plate and stainless steel and finished in baked enamel.

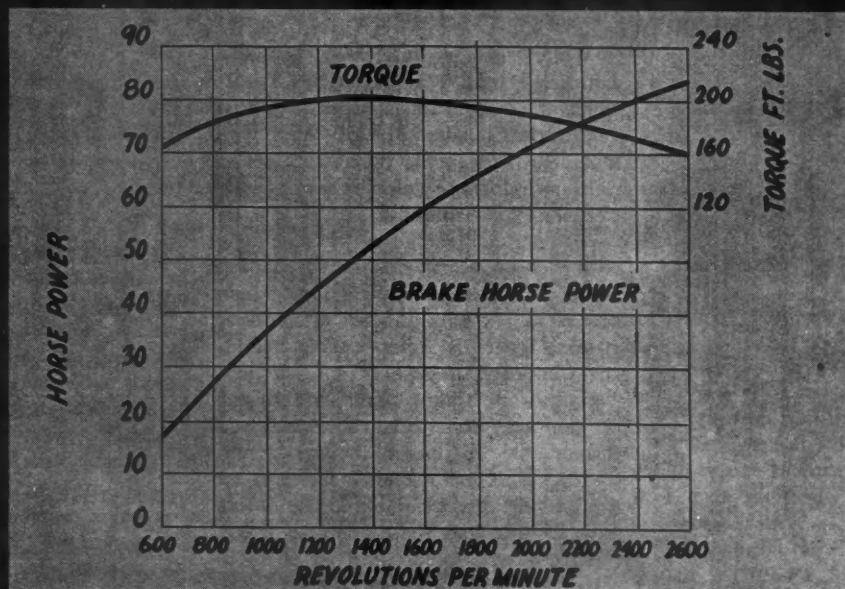
Left—Grille, cab, fenders are redesigned  
Below—Rubber-mounted propeller-shaft carrier bearing





# Buda Has Light 84 hp. Diesel

New Six-Cylinder Engine Has 275 cu. in. Piston Displacement and 200 lb. ft. Torque at 1300 r.p.m.; Lanova Combustion System Used



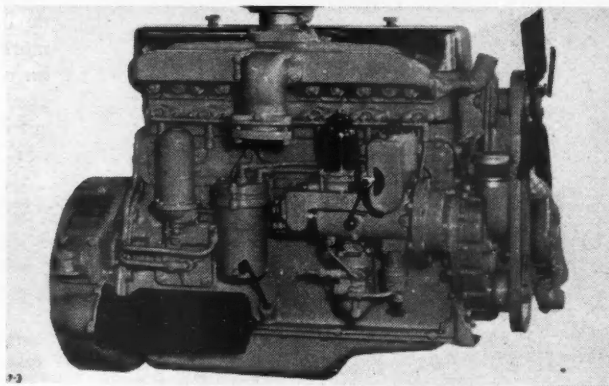
Buda—Lanova Diesel Model 6LD-275, 6-cyl.,  $3\frac{1}{2}$  bore x  $4\frac{3}{4}$  stroke, 275 cu. in. displacement, 14:1 comp. ratio

**T**HE Buda Co., Harvey Ill., has entered the small diesel field with a new Buda-Lanova diesel engine of six cylinders and 275 cu. in. piston displacement. It is the Model 6LD-275. The name Lanova comes from the type of combustion system used. (See illustration.)

The cylinder bore of this engine is  $3\frac{1}{2}$  in. and the stroke is  $4\frac{3}{4}$  in. Horsepower is 84 at 2600 r.p.m. which is the peak, and 37 at 1000 r.p.m. The torque is 200 lb. ft. at 1300 R.P.M.

The combustion system is decidedly different. The fuel leaves the nozzle (left) and passes along the common center of two lobes formed in the cylinder head under the valves and directly over the cylinder proper through the hot compressed air which is generated in the compression stroke, into the minor and major air chambers or energy chambers. (Right.)

The combustion set up in these energy chambers violently discharges back into the main combustion chamber, thus impinging upon such residual spray as is still leaving the nozzle and is in suspension. This counterflow or



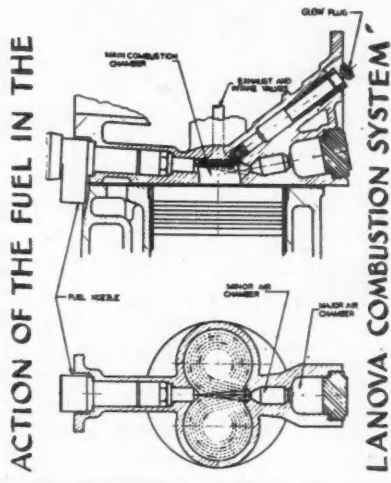
backfire of the energy chamber sets up a violent turbulence which is divided in such a manner as to create a right and left rotary motion in that lobe under each valve. This self-induced turbulence so thoroughly mixes all atomized fuel with its proper air content that this type of combustion has proven to operate under all ranges of speed and allowable load up to rating on the

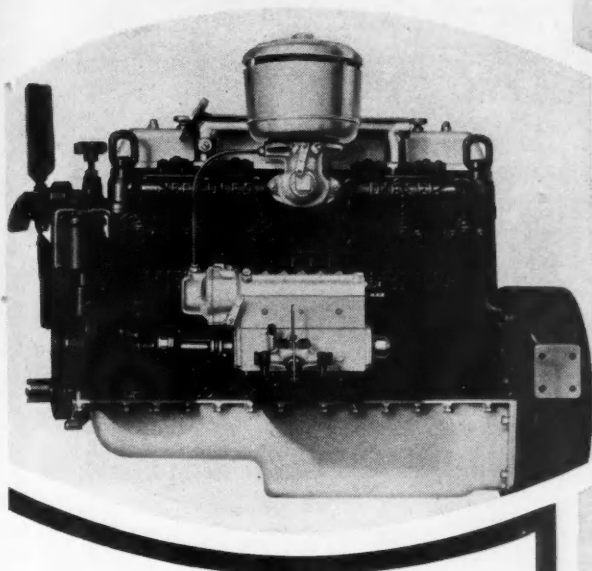
minimum of excess air.

The fuel pump is the plunger-type integral with the Ex-Cell-O injection pump. There is a hand-priming pump. Lubricating oil is regulated by a spring-loaded by-pass valve and both lubricating and fuel oil pass through ample-sized filters, which are accessible for cleaning from the outside. Lubrication is by full pressure, including the rocker arms.

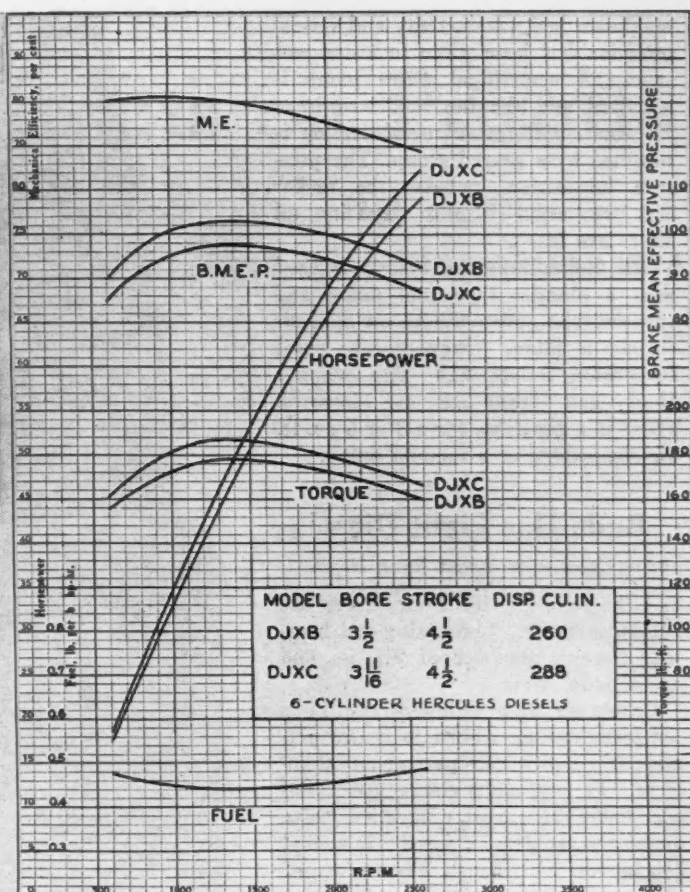
In the cooling system the pump runs at engine speed. A stainless steel water-pump shaft is driven from an accessory shaft. Main bearings are 3 in. in diameter, the width of the front bearing being  $1\frac{1}{2}$  in., the center 2 in.

(TURN TO PAGE 32, PLEASE)





Above—Hercules' small six-cylinder diesel similar in installation dimensions and displacement to Hercules gasoline engines. Right—Performance chart of the DJXB and DJXC diesels



**T**HE Hercules Motors Corp., Canton, O., announces the DJX series of small diesel engines as a step in its program to make available a complete line of high-speed six-cylinder diesel engines, similar in installation dimensions and displacement to Hercules gasoline engines.

The DJXB is the smallest of the two new engines, having a bore of 3 1/2 in. and a stroke of 4 1/2 in., giving a displacement of 260 cu. in. On a dynamometer this engine is rated at 79 hp. at 2600 r.p.m. The maximum torque is 179 lb. ft. at 1300 r.p.m. Both engines of the DJX series weigh approximately 825 lb. with fuel handling equipment.

The DJXC has 288 cu. in. of piston displacement. The bore is 3 11/16 in. and the stroke is 4 1/2 in. This gives a brake horsepower of 82 1/2 at 2600 r.p.m. The torque peaks at 1300 r.p.m. with 187 lb. ft.

The general design of these engines follows that developed by experience with larger diesels, including the auxiliary combustion chamber which assures complete combustion and control of the burning fuel. The combustion chamber is an American development and was designed and patented by Hercules. This combustion chamber is located at the side of the cylinder bore, and the throat which connects the cylinder with the chamber is so designed that the piston on its approach to top center on the compression

## Hercules Adds 260 and 288-in. Diesels

**New Six-Cylinder Engines Weigh 825 lb. One Has 79 hp. at 2600 and 179 lb. ft. Torque at 1300; Other Has 82 1/2 hp. at 2600 and 187 lb. ft. Torque at 1300**

stroke gradually reduces the throat area, automatically increasing the velocity of the air entering the chamber at the time the fuel is injected. This action insures a very thorough mixing of fuel and air. The compression ratio is 14.5 to 1.

Both engines have seven main bearings of 3 in. diameter. The widest main bearing is the rear, which is

2 1/16 in., and the narrowest is the front, which is 1 1/4 in. Connecting rod bearing sizes are 2 1/2 in. in diameter and 1 25/32 in. wide. Center to center the rod is 8 in.

Connecting rods are made of heat treated nickel chrome molybdenum steel. The camshaft operates on four bearings of 2 1/16 in. diameter.

Aluminum alloy pistons are used for

maximum heat conductivity and special attention has been given to water passages. A centrifugal water pump is standard and the fan is driven by a "V" belt. Full pressure lubrication is supplied by a geared pump. The pressure lubrication includes the rocker arm assembly. Excess capacity oil filters are fitted.

The Bosch injection system is used with a plunger type fuel pump and vacuum type governor. An oil bath air cleaner is fitted. Three or four point suspension is optional. The cylinder block and crankcase are integral. There is a provision for a 3 or 6 cu. ft. air compressor or a vacuum pump.

## Buda Has Light Diesel

(CONTINUED FROM PAGE 30)

and the rear  $2\frac{1}{8}$  in. Four others are  $1\frac{1}{16}$  in. wide. Connecting rod bearings have a diameter of  $2\frac{1}{8}$  in. and are  $1\frac{5}{8}$  in. wide.

Crankcase and cylinders are in a one-piece casting ribbed to insure permanent rigidity and permanent alignment. Pressed-in-dry-sleeve-type cylinder liners are used. Effective valve diameters are  $1\frac{3}{8}$  in. for the inlet and  $1\frac{1}{8}$  in. for the exhaust. Pistons are of aluminum alloy using five rings per piston. Full-floating piston pins  $1\frac{1}{4}$  in. in diameter are used.

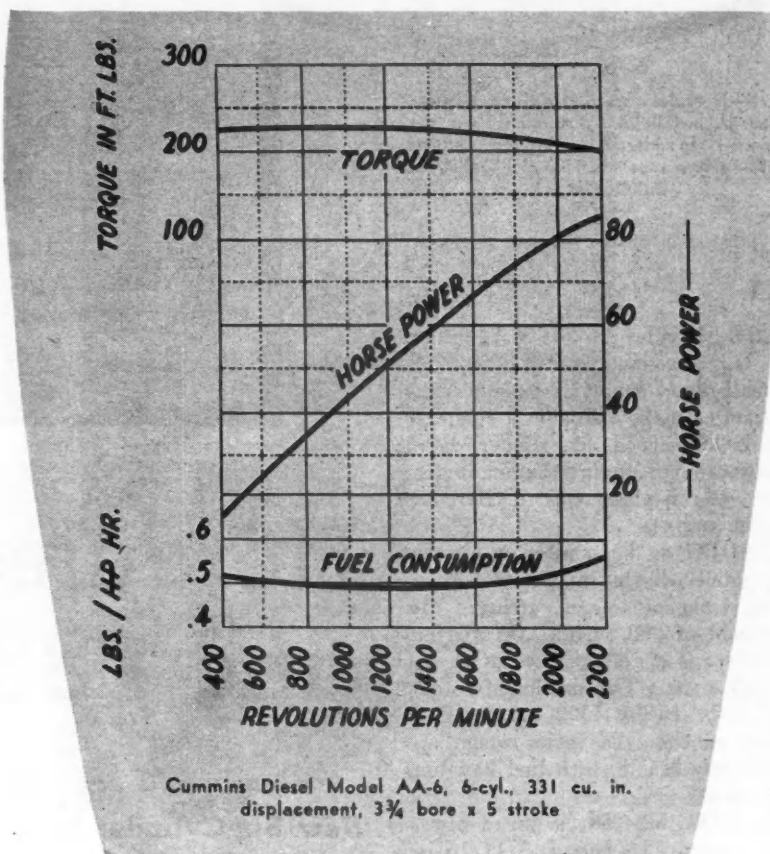
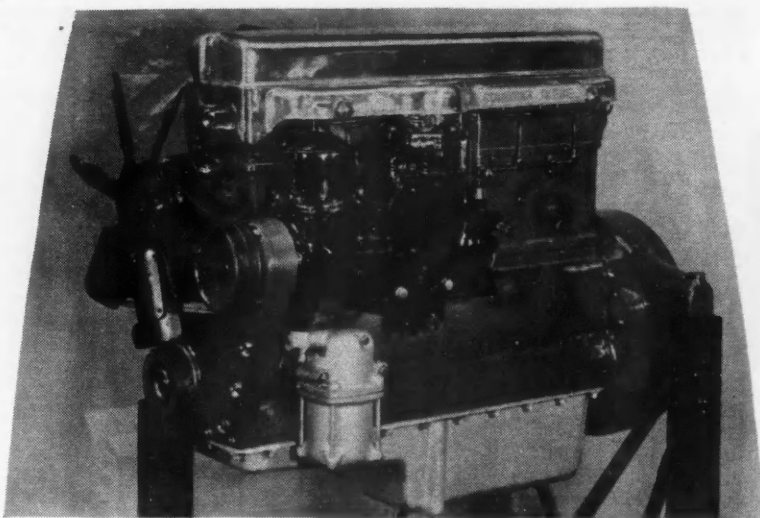
Nozzles are of the pintle, self-cleaning type. The diameter of the pintle is 2 mm. The governor is driven from the fuel pump drive-shaft. The engine may be governed from 300 r.p.m. to 2600 r.p.m. Glow plugs are included in the design for easy starting. The compression ratio is  $12\frac{1}{2}$  to 1 and the maximum combustion chamber pressures are 625 lb. per square inch. Since the combustion system used prevents the fuel from striking the piston or cylinder walls, the piston temperatures are kept about the same as in a gasoline engine.

## Hercules Establishes Muskegon Plant

The Hercules Motors Corp., Canton, Ohio, has announced the establishment of a branch factory at Muskegon, Mich. Machinery and equipment are now being installed and operations will be begun shortly. Hercules is also increasing its facilities at Canton.

## Specht Acquires Servel Body

G. K. Specht, who has been identified with the body industry for many years, has taken over the body business of Servel, Inc., who discontinued operation last Oct. 31, and will operate it under the name of Hercules Body Co. at the same address, Evansville, Ind. According to Mr. Specht, Hercules dump bodies will be continued in the line and additional steel products will be announced at a later date.



## Performance Characteristics of Cummins Diesel Model AA-6

THE model AA-6, six-cylinder diesel shown above is the Cummins Engine Co.'s entry in the small diesel field. It is a 331.4 cu. in. displacement engine with  $3\frac{3}{4}$  in. bore x 5-in. stroke. The weight of the engine is 1200 lb. with accessories. A full description of the engine appeared in *COMMERCIAL CAR JOURNAL* for last August.

The performance chart shows that maximum torque is 230 lb. ft. at 800 r.p.m. Horsepower is 85 at 2200 r.p.m. The AMA horsepower rating is 33.7.

The fuel pump, governor and lubrication pump on this engine are built as a single unit with the fuel distributor and are, of course, of Cummins design. Aluminum AA-6 engine is 840 lb.



# New Products on Parade

Descriptions of the Latest Items Put on the Truck Market by Equipment and Specialty Manufacturers

## Decelerometer

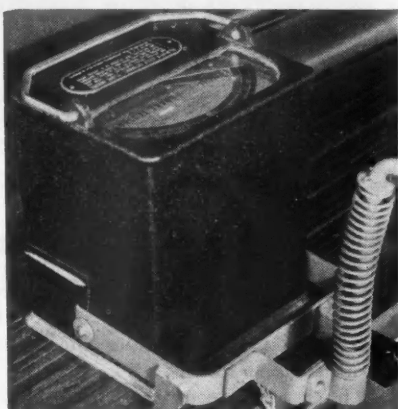
THE Friedli-Feragen decelerometer records a 20 mile an hour stop even though the car may actually be traveling slower or faster than that speed at the moment the brakes are applied. Its action is automatic and two readings are made of every stop, one recorded on a card and the other on the scale on top of the instrument. In operation the decelerometer is clamped to the left running board, the car is brought up to speed, and then stopped as quickly as possible by applying the foot brakes. This device is easily portable, its dimensions being 6 x 4 x 7 in. and weight 14 lbs. It is manufactured by the Bendix Products Corp., South Bend, Ind.

## Thor Electric Drill

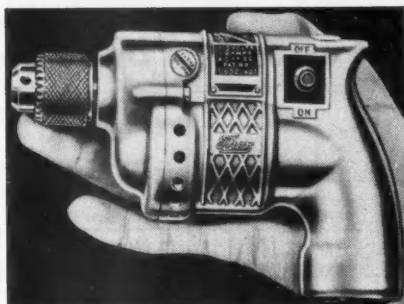
THE new 1/4 in. Thor, model U-14, is the smallest, lightest weight portable electric drill ever built by the Independent Pneumatic Tool Co., 600 West Jackson Blvd., Chicago, Ill. Weighing only 2 1/2 lbs., it can easily be operated with one hand. It features a hand-wound armature and a specially constructed commutator as well as a ventilating system said to effectually cool the motor even under severe load. Helical gears together with ball bearing mountings are claimed to largely eliminate noise and vibration. The machine is equipped with a Jacobs chuck.

## New Model Oil Cleaner

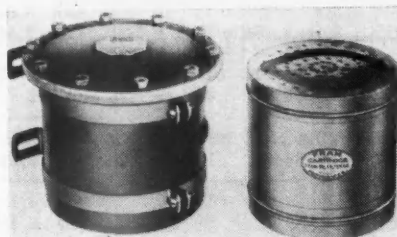
THE Fleming Mfg. Co., Inc., Worcester, Mass., has introduced the model F-2 Fram oil cleaner for large trucks and buses. It comprises a seamless one-piece body of heavy pressed steel and a heavy one-piece cover bolted to the body with 10 bolts to insure against leakage. The Fram replacement cartridge is readily changed by removing the nuts and cover, lifting out the old cartridge and inserting a new one. There are no pipe connections to break when making this change. The Fram cleaner is said to remove dirt, abrasives, and sludge-forming materials from the oil and to thoroughly remove harmful acids.



Friedli-Feragen decelerometer

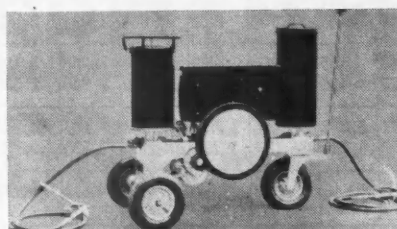


Thor model U-14 electric drill



Model F-2 Fram oil cleaner

Two-way electric grease gun



## Electric Grease Gun

THE Precision electric grease gun is entirely self contained, being battery operated, and so can be easily moved from truck to truck either inside or outside the garage. A two h.p. electric motor builds up pressure to the end of the hose, where the flow is controlled by the operator.

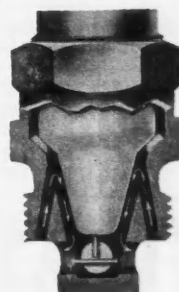
The pressure is adjustable up to 12,000 lbs. A single battery charge is said to furnish enough power to grease from 60 to 75 trucks, and when re-charging is required it is only necessary to plug the extension cord into any standard electric outlet, as a 5 ampere battery charger is built into the machine. The "Pep" gun which is furnished in either a one or two gun model is distributed by the Pep Sales & Service Co., division of the Precision Gear & Machine Co., Inc., Charlotte, N. C.

## Valvpack for Worn Motors

THE American Hammered Piston Ring Co., Baltimore, Md., has added to its line Valvpack, a valve stem packing to control excessive oil consumption caused by worn intake valve stems and guides. The Valvpack cup fits over the lower end of the guide and holds felt packing tightly against the stem by means of a small wire spring. List price \$.25.

## Standard Spark Plug

THE Standard Spark Plug Co., 4505 Wayne Ave., Philadelphia, Pa., is manufacturing the Standard spark plug, which



is made with three holes at the side and three smaller holes on the bottom of the combustion chamber. It is claimed that air enters these passages and circulates around the porcelain insulator keeping it cool and clean. Due to the special type construction, only five types of plugs are needed for all makes of cars and trucks. Three thread sizes are supplied to take care of all standard engines.

(TURN TO PAGE 85, PLEASE)

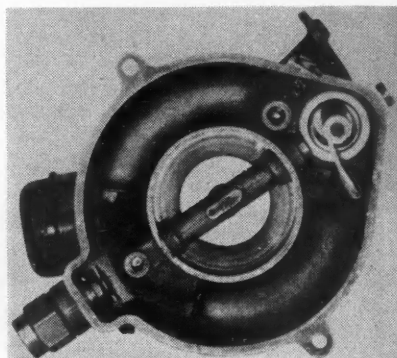
# New Carburetor Has a Concentric Float

A NEW type of carburetor incorporating some novel features of construction has been placed on the market by Chandler-Groves Co., Detroit.

At the moment, the company is concentrating on the manufacture of 1¼ and 1½-in. sizes in a single down-draft carburetor. Later they expect to introduce a dual downdraft carburetor line and probably an automatic choke.

The 1¼-in. carburetor is illustrated here. The usual low-speed adjustments are provided. An important feature of this unit is the concentric float mechanism. It is of horseshoe form, hinged at the right, the chamber and float completely encircling the central venturi. The spray nozzle is pointed downward at the center from the underside of the central tube.

It is claimed that the use of a concentric float mechanism aids in producing improved and uninterrupted distribution, due to unobstructed passages

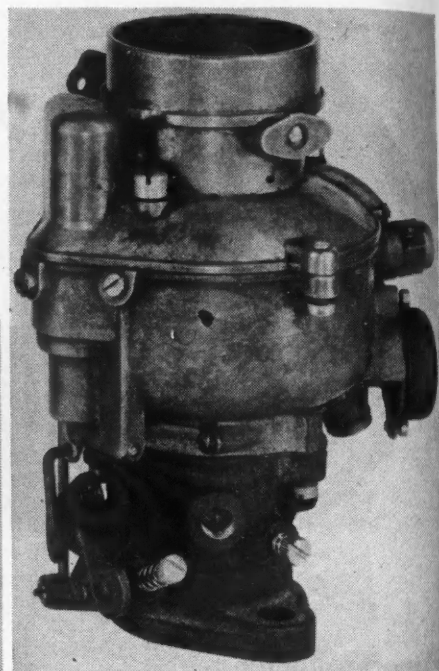


View of concentric float mechanism . . . of this 1¼-in. carburetor unit

and the centrally located main jet. This is said to be particularly effective on up and down-grades and in fast cornering where there is a tendency to starve the main jet under the action of centrifugal force.

The vacuum economizer is of diaphragm type, simple in design and in-

dependent as to operation and adjustment from the metering system. The idler system does not necessitate reversal of fuel flow in transferring from low to high-speed settings. It is claimed that there are no moving elements which through wear might decrease the carburetor's efficiency.



## New Truck Registrations by Makes by Months

	Autocar	Brookway	Chevrolet	Diamond T	Dodge	Federal	Ford	G. M. C.	International	Mack	Reo	Sterling	Stewart	Studebaker	White-Indiana	Miscellaneous	Total
January.....1935	71	86	9,867	550	5,141	152	13,260	858	3,513	114	380	10	42	127	308	280	34,759
January.....1934	79	91	8,917	406	2,581	120	6,650	555	2,284	161	289	9	61	98	284	318	22,903
February.....1935	41	54	11,701	499	3,271	113	14,330	570	3,174	63	292	10	34	107	217	321	34,797
February.....1934	58	81	10,718	420	2,723	121	6,459	453	2,150	144	339	14	60	109	357	270	24,476
March.....1935	56	67	13,744	534	4,284	132	16,805	850	3,673	100	389	14	60	135	258	410	41,511
March.....1934	64	117	15,112	501	4,154	170	8,632	717	2,841	145	461	10	67	126	452	315	33,884
April.....1935	79	109	15,024	568	5,708	177	17,943	870	4,554	159	449	31	62	189	309	554	46,785
April.....1934	88	104	15,050	534	4,367	178	13,167	839	2,729	206	527	4	90	123	558	318	38,882
May.....1935	78	97	16,284	570	5,381	193	17,591	883	4,807	189	616	5	60	229	294	691	47,968
May.....1934	146	117	14,148	508	4,441	186	14,390	1,031	2,849	212	578	10	103	193	544	375	39,831
June.....1935	73	113	17,576	572	4,911	178	17,385	901	4,710	103	439	16	69	218	258	721	48,243
June.....1934	95	108	12,981	481	3,729	196	12,205	884	2,435	154	504	9	67	133	447	350	34,778
July.....1935	99	114	18,608	593	5,336	202	18,073	857	5,308	147	439	19	85	219	336	808	51,243
July.....1934	99	147	14,704	457	4,224	182	12,492	951	2,548	202	416	17	67	156	396	432	37,490
August.....1935	91	143	18,554	591	5,723	219	16,429	1,312	5,231	145	476	9	94	264	354	720	50,355
August.....1934	61	107	15,790	508	4,754	162	14,055	1,033	2,809	143	439	15	56	138	337	383	40,790
September.....1935	76	128	13,783	555	5,901	209	14,126	1,362	5,199	111	427	9	94	188	547	519	43,234
September.....1934	118	74	15,159	420	4,086	158	12,250	1,240	2,538	103	369	3	31	153	238	285	37,225
9 Months.....1935	664	911	135,141	5,032	45,656	1,575	145,942	8,463	40,169	1,131	3,907	123	600	1,676	2,881	5,024	398,895
9 Months.....1934	908	946	122,569	4,235	35,059	1,473	100,300	7,703	23,183	1,470	3,922	91	602	1,229	3,613	3,046	310,249
% Change.....9 Months	-18	-4	+10	+19	+30	+7	+46	+10	+73	-23	.....	+35	.....	+36	-20	+65	+29

# HYDRAULIC BRAKING

For twelve years, one of the  
*big influences in truck selling . . .*

*Now stronger than ever!*

THE motor truck industry is one of constant progress. Important changes follow one another in quick succession. Even such a basic function as engine lubrication has undergone a virtual revolution, during the dozen years since hydraulic braking was introduced to American automotive engineering.

Yet hydraulic braking has never ceased to advance in public and professional esteem. Year after year, its friends increase.

For 1936, count for yourself the number, and standing, of the trucks and motor cars with hydraulic braking—consider these reasons why:

Hydraulic braking means an easy, cushioned pedal, enduringly equalized pressure, freedom from noises, no need for lubrication, and lower servicing overhead.

The truck with hydraulic brakes is to be preferred . . . and *is* preferred.

HYDRAULIC BRAKE COMPANY  
DETROIT, MICHIGAN

## LOCKHEED HYDRAULIC

*Four* BRAKES *Wheel*

OFFICIALLY SERVICED THROUGHOUT THE NATION BY WAGNER ELECTRIC CORPORATION

DECEMBER, 1935

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Total

34,759  
22,903

34,797  
24,476

41,511  
33,884

46,785  
38,882

47,968  
39,831

48,243  
34,778

51,243  
37,400

50,355  
40,790

43,234  
37,225

398,895  
310,249

+29

JOURNAL



# NEWS

## Rates and Tariffs Filing Jan. 15

The date for filing of rates and tariffs by common carriers and contract carriers operating motor vehicles in interstate commerce has been extended to Jan. 15, 1936, by the Bureau of Motor Vehicles of the ICC. The date when the rates filed shall become effective was extended to Feb. 14, 1936.

## Penn P.S.C. Modifies Ruling

Approximately 8000 truckers were affected by the recent ruling of the Pennsylvania Public Service Commission when its rules and regulations governing common carriers of property by motor vehicle were modified to relieve certain classes of truckers from periodically renewing their certificates of public convenience.

Certificates granted for an indeterminate period affect operators transporting property in boroughs or townships, or farm produce, milk and farm supplies between points not exceeding 25 miles, transportation of earth, debris, stone and similar construction material usually carried in dump trucks. Certificates authorizing transportation of property between fixed termini over definite routes are first granted for two years, subject to renewal, the renewal certificate to be issued for an indeterminate period.

## Brake Linings Sales Jump

Manufacturers' sales of brake linings and clutch facings in the first six months of 1935 were 14 per cent above the same period in 1934, with sales for the second quarter 11 per cent higher than the second quarter of 1934.

## New Kellogg Co. Formed

The Kellogg Compressor & Mfg. Corp. has been incorporated under the laws of the State of New York to take over all the assets of the Kellogg Mfg. Co. J. F. Weller has been named president.

## Retzlaff Is Fruehauf Sales Engineer

W. G. Retzlaff has joined the staff of the Fruehauf Trailer Co., in charge of sales engineering, according to G. W. Chamberlin, vice-president and director of sales.

## Aluminum Industries Acquires Dall

Purchase of the assets of the Dall Mfg. Co., Inc., Cleveland, Ohio, makers of cast iron pistons, has been announced by Aluminum Industries, Inc., Cincinnati.

## Winner Leaves Fitz-Gibbons & Crisp

Hudson T. Winner, president of Fitz-Gibbons & Crisp, has sold his interest in that company.

## Champion Adds to Plant

The Champion Spark Plug Co. has awarded a contract for a new five-story addition to its Toledo plant which will increase manufacturing capacity by more than 30 per cent.

## Truck Sales Up 26% Output Rises 17.5%

### Increases Are for First 10 Months; Oct. Sales Up 5%

New truck registrations for the first 10 months of 1935 amounted to approximately 442,000, according to an estimate based on actual returns for nine months and 27 states for the month of October. This is an increase of approximately 26 per cent over the 351,127 registered during the first 10 months of 1934. October registrations amounted to 43,000, an increase of 5 per cent over the 40,878 registered in October, 1934, but approximately the same as the registrations during September, 1935.

Production for 10 months amounted to 613,000 units as against 521,676 for the comparable period of 1934, a gain of about 17.5 per cent. October production is estimated at approximately 44,000 as against 49,643 during October, 1934, a decrease of about 11 per cent.

## Frost Is NADA G. M.

Jack Frost has succeeded F. W. A. Vesper as general manager of National Automobile Dealers' Association. Mr. Vesper remains as president of the dealer organization.

## Federal Meet Marks 25th Birthday

The Federal Motor Truck Co.'s annual convention was held in Detroit last month. The convention marked the 25th anniversary of the founding of the company.

## Service Industries Show

The Service Industries Show, with all plans complete, is prepared to open at Convention Hall, Atlantic City, December 9. The number of exhibitors and the attendance are expected to set an all-time record.

## Sunnen Expands

A new addition just being completed will double the size of the Sunnen factory at St. Louis.

## Moreland Receivership Lifted

The Moreland Motor Truck Co., Burbank, Calif., has announced through its president, Watt L. Moreland, that the friendly receivership entered into by the company in 1933 was lifted last Oct. 14. The company's financial position has been greatly improved through a loan provided by the RFC. Outstanding obligations have been settled and old stockholders have exchanged their holdings for stock in the new issue. A completely redesigned line of trucks for 1936 is now in production and will be shown soon.

## No Outsiders in Fruehauf Co.

Rumors to the effect that various individuals in the trucking industry have acquired financial interest in Fruehauf Trailer Co. are denied by Harvey C. Fruehauf, president.

"No trucking operator has any financial interest in the Fruehauf Trailer Co., neither does any trucking operator serve as director of our company or in any other official capacity," he said. The Fruehauf Trailer Co. is a closed corporation and control is held by the Fruehauf family.

## Gas Taxes Slapped Down

Four recent executive, judicial and legislative actions took slaps at gasoline tax increases. The Supreme Court of Nebraska has ruled the one cent per gallon increase in the state's gasoline tax passed last March unconstitutional. Gov. Tom Berry of South Dakota refused to call a special session of the legislature to consider an increase in gasoline taxes. The City Council of Jacksonville, Fla., turned down a proposal to increase taxes and the county commissioners of Jackson and Harrison counties in Mississippi have eliminated their 2-cent county levies.

## White Ups Bauman, Bander, Searles

J. N. Bauman, general sales manager, White Motor Co., was elected vice-president in charge of sales at a recent meeting of the board of directors. Frank M. Bender was elected vice-president in charge of operations and W. S. Searles was named secretary of the company. T. R. Dahl, executive vice-president and secretary has resigned.

## FWD Ups Daniels, Waterland

H. M. Daniels has been named supervisor of the new consolidated Eastern sales division of the Four Wheel Drive Auto Co., Wisconsin. A. F. Waterland is manager of the new Philadelphia branch.

## Simplex Buys New Plant

Purchase of a new and larger manufacturing plant at 3830 Kelley Ave., Cleveland, by the Simplex Products Corp., makers of Simplex Melium piston rings and other replacement parts.

## Six Licensed to Make Tire Chains

Six tire chain manufacturers have been licensed to make and sell bar-reinforced tire chains. They are: Chain Products Co., Cleveland; Pyrene Mfg. Co., Newark, and Pyrene Mfg. Co. of Canada, Ltd., Toronto; The McKay Co., Pittsburgh; Dominion Chain Co., Ltd., Niagara Falls, Ontario; American Chain Co., Inc., Bridgeport, Conn.

## Johns-Manville Is Gilmer Rep.

Johns-Manville Sales Corp. of New York will be sole sales agents in U. S. and Canada for the L. H. Gilmer Co. automotive products, effective Dec. 1.



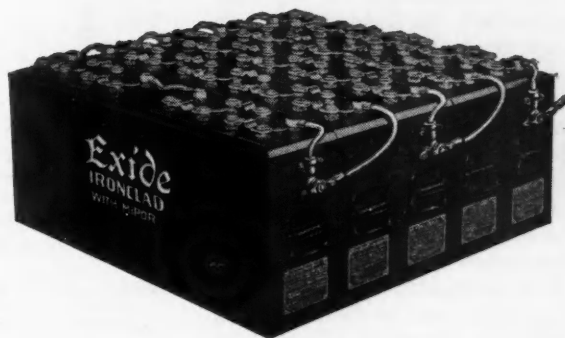
## THE ELECTRIC TRUCK, WITH AN EXIDE-IRONCLAD BATTERY, OFFERS MANY UNIQUE ADVANTAGES . . . .

BY overlooking the special advantages of electric trucks, many operators are neglecting an opportunity to make a tremendous saving. There are certain types of service in which such units excel all others.

Where the nature of a delivery route or traffic conditions make high speeds unattainable, where constant starting and stopping keep operating and maintenance costs high, and where delivery costs have an important bearing on net profits—the modern electric truck, powered by the right battery, will show a big margin of saving.

Some of the largest fleet operators in the country are using such trucks, equipped with Exide-Ironclad Batteries. They have found that Exide-Ironclads have enormous reserve power for exceptional loads and grades, that they maintain a high voltage and good vehicle speeds throughout the day—and that they give long, economical service with a minimum of attention.

Write for free booklet, "Modern Electric Motor Trucks for Economical Deliveries in Metropolitan Areas."



# Exide IRONCLAD BATTERIES

WITH EXIDE MIPOR SEPARATORS

"MIPOR," Reg. U. S. Pat. Off.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia

*The World's Largest Manufacturers of Storage Batteries for Every Purpose*

Exide Batteries of Canada, Limited, Toronto

## DIESEL AND GASOLINE ENGINE COSTS

(CONTINUED FROM PAGE 15)

gross weight of truck and trailer was 68,000 lb. The equipment at times was operated fully loaded, partially loaded, and in some cases empty; but all trucks and trailers were operated with an average gross-weight load factor of 70 per cent, or 47,600 lb.

A study of the operating costs of these 20 pieces of equipment developed the fact that a few of the costs entering into the operation of both the gasoline and diesel equipment were equal in each case—such as license fees, weight fees, taxes, storage, driver's wages, and public-liability and property-damage insurance. These costs were, therefore, eliminated from the study. The remaining operating costs, viz., fuel, lubricants, maintenance, depreciation, interest on investment, and fire and theft insurance—not being the same for the two types of equipment—were carefully analyzed and compared.

**A** STUDY was made of the 10 diesel trucks, for the first four months of 1934, covering gallons of fuel used and its cost, gallons of oil used and its cost, cost of repairs, parts and labor, and the miles operated. These cost figures, and the basic units developed therefrom, are itemized in Table 1.

The same study was made for the identical equipment for the first four months of 1935, and the data and basic units developed are itemized in Table 2.

A similar study was made for the 10 gasoline-equipped trucks, for the first four months of 1934, and the cost data and basic units are recorded in Table 3. No study was made of this equipment for the first four months of 1935, for the reason that prior to 1935 the gasoline motors had all been replaced with diesel motors.

The gasoline used in the trucks was the typical second-structure West Coast gasoline of approximately 70 octane number. The diesel fuel was typical of Los Angeles Basin crude production, and had the following general characteristics:

### Diesel Fuel

API gravity at 60 deg. F. ....	30-32
Viscosity, Saybolt Universal, at 100 deg. F. ....	40-43
Distillation range, deg. F. ....	420-760
Cetene number. ....	50-55
Diesel-index number. ....	40-48
Conradson carbon residue, per cent. ....	0.05-0.10
Sulfur, per cent. ....	0.5 -0.7

Under the present conditions of dis-

TABLE 1

Diesel Fuel Used, Lubricating Oil Consumed, Miles Operated—and Cost of Fuel, Oil, and Maintenance for First Four Months of 1934 and for Reference Designated As: Group A-34

Truck No.	Fuel Used		Oil Used		Repairs, Parts, and Labor Cost	Miles Operated	
	Gallons	Cost	Gallons	Cost			
152 * .....	2,599	\$74.20	89	\$39.20	\$462.54	13,985	
174 * .....	4,206	118.53	172½	76.54	677.60	25,503	
282 * .....	4,159	116.97	171½	76.73	517.28	22,151	
284 * .....	3,750	106.00	170¼	75.32	585.59	24,247	
266 * .....	3,211	90.69	101½	44.80	307.70	16,121	
836 * .....	5,711	216.35	292¾	133.03	816.07	33,779	
843 * .....	5,748	240.19	218½	98.32	726.75	39,880	
898 * .....	3,938	152.38	154¼	80.70	407.95	25,652	
958 * .....	4,990	199.55	174	85.70	439.80	32,025	
966* .....	5,699	230.17	314½	154.63	688.74	36,145	
Totals ...	44,011	\$1,543.03	1,858¾	\$864.97	\$5,630.02	268,488	
Average cost of fuel per gallon ..		\$0.0351	Miles per gallon of oil .....		144.4		
Average cost of oil per gallon .....		\$0.4653	Fuel cost per mile .....		\$0.00575		
Average miles per truck per mo. ....		6,712	Oil cost per mile .....		\$0.00322		
Average miles per truck per day ..		224	Repair cost per mile .....		\$0.02097		
Miles per gallon of fuel .....		6.10	Total cost per mile .....				\$0.02994

\* Sterling Truck FC-135 Model, with a Cummins six-cylinder diesel motor, pulling six-wheel, 10-ton trailer. Weight of truck, empty, 16,245 lb.; Weight of trailer, empty, 15,500 lb.; Legal gross weight of truck and trailer, 68,000 lb.

TABLE 2

Diesel Fuel Used, Lubricating Oil Consumed, Miles Operated—and Cost of Fuel, Oil, and Maintenance for First Four Months of 1935 and for Reference Designated As: Group A-35

Truck No.	Fuel Used		Oil Used		Repairs, Parts, and Labor Cost	Miles Operated	
	Gallons	Cost	Gallons	Cost			
152 *	3,890	\$119.57	136½	\$65.69	\$401.55	22,455	
174 *	3,872	119.21	132¾	60.86	521.27	23,224	
282 *	2,199	67.27	95¾	45.46	616.53	10,587	
284 *	3,781	116.40	111¼	51.13	384.13	19,838	
266 *	1,650	51.02	77¼	35.44	170.64	8,250	
836 *	6,173	368.25	282¾	133.04	703.38	41,540	
848 *	6,342	330.44	242¼	113.63	837.74	38,800	
898 *	3,166	111.33	87½	41.12	494.94	20,190	
958 *	6,891	337.96	384¼	163.62	483.14	43,438	
966 *	3,816	117.59	173	79.87	838.61	19,410	
Totals ..	41,780	\$1,739.04	1,723¼	789.86	\$5,451.93	247,732	
Average cost of fuel per gallon ..		\$0.0416	Miles per gallon of oil .....			143.8	
Average cost of oil per gallon ..		\$0.4583	Fuel cost per mile .....		\$0.00702		
Average miles per truck per mo. ....		6,193	Oil cost per mile .....		\$0.00319		
Average miles per truck per day ..		208	Repair cost per mile .....		\$0.02200		
Miles per gallon of fuel .....		5.93	Total cost per mile .....				\$0.03221

\* Sterling Truck FC-135 Model, with a Cummins six-cylinder diesel motor, pulling six-wheel, 10-ton trailer. Weight of truck, empty, 16,245 lb.; Weight of trailer, empty, 15,500 lb.; Legal gross weight of truck and trailer, 68,000 lb.

tribution Pacific Freight Lines has found it necessary to centrifuge all diesel fuel before putting it into the delivery tanks. Such materials as tank scale, dust, asphaltic particles, etc., must be removed before going to the engine-fuel system, because otherwise clogging of the filters occurs and causes damage to the finely-fitted parts such as the fuel pump, injection nozzles, etc. This latter problem of maintenance of a clean fuel, up to the time of delivery to the consumer, is one that is being studied by the various oil companies; since it eventually must be solved, just as in the case of gasoline distribution.

The higher viscosity of the diesel fuel makes clarification somewhat more difficult, but no doubt the problem can be successfully overcome.

The basic units developed from Tables 1, 2, and 3 have been recapitulated (for ease of comparison) in Table 4, and in this table depreciation, interest on investment, and insurance have been included.

**I**N Table 5 the cost units which were listed in Table 4, on a cost-per-mile basis, have been expanded to a cost-per-million truck miles, as it is much easier to visualize the comparison of cost of



operation between the two types of equipment, on a dollar-and-cents basis, magnified a million times, than it is to deal with the cost-per-mile units itemized in Table 4. As Tables 4 and 5 are essentially a recapitulation of the data contained in Tables 1, 2, and 3, all remarks and conclusions will be directed to and drawn from the data contained in the last two tables.

The facts developed by the data contained in Table 4 can be listed as follows:

1. A diesel motor runs between 60 and 65 per cent further on a gallon of fuel than a gasoline motor.

2. The cost of fuel, per mile for a gasoline-motored truck, is slightly over six times greater than for a similar diesel-motored truck.

3. A diesel motor uses slightly more lubricating oil than does a gasoline motor; and all other expense items, viz., oil, repairs, depreciation, interest, and insurance, are in every case greater for the diesel-motored truck.

Table 4 shows the combined costs for gasoline-truck operation to be \$0.09057 per mile, and the costs of diesel-truck operation \$0.06530 per mile—giving a differential, in favor of the diesel operation, of \$0.02527 per mile.

In Table 5 it is seen that the cost of fuel for a diesel motor is 83.58 per cent less than for the gasoline motor, whereas the cost of repairs is 27.11 per cent higher. Incidentally, this is about the same repair ratio that is experienced by the operators of diesel trucks in Europe. Several reports available indicate their maintenance costs to be 26 to 31 per cent higher than the maintenance on gasoline-motored equipment. Table 5 also shows that whereas the saving on fuel is 83.58 per cent, the other expense items for the diesel motor are sufficiently greater so that this percentage is reduced to a net of only 27.91 per cent. This represents, however, for one million diesel-truck miles, a saving of \$25,260.

**FUEL** economy is the chief reason for the use of the diesel motor. According to Table 4, the diesel-motored truck can be operated for a fuel cost of \$0.00638 per mile, whereas the fuel cost for the gasoline-motored truck is \$0.03947. The cost of diesel fuel would, therefore, have to increase 610 per cent before the fuel cost would equalize as between the two types of equipment. Since the net saving on the operation of the diesel, as shown by Table 4, is only \$0.02527 per mile, the cost of diesel fuel would have to increase 390 per cent to equalize the cost of operation between the two types of equipment. It must be remembered, however, that the gasoline motor, as we see it today, represents the result of 20

TABLE 3

Gasoline Fuel Used, Lubricating Oil Consumed, Miles Operated—and Cost of Fuel, Oil, and Maintenance for First Four Months of 1934, and for Reference Designated as: Group B-34

Truck No.	Fuel Used		Oil Used		Repairs, Parts, and Labor Cost	Miles Operated
	Gallons	Cost	Gallons	Cost		
160 *	6,565	\$860.55	115	\$60.47	\$428.66	21,366
270 *	7,558	912.59	124	55.12	299.09	17,662
272 *	7,019	830.53	153 3/4	68.93	157.83	23,075
274 *	4,913	545.12	71	31.62	685.67	15,848
276 *	7,124	852.63	115 1/2	51.14	372.86	22,651
950 *	6,143	742.20	134 1/4	64.13	313.36	19,939
956 *	6,583	829.12	98	48.82	208.70	19,981
960 *	6,638	774.12	89 3/4	40.61	261.44	19,930
826 *	3,295	397.54	119 3/4	52.68	110.71	9,977
830 *	4,245	529.74	128 1/2	69.93	281.49	14,107
Totals ..	60,083	\$7,274.14	1,149 1/2	\$543.45	\$3,119.81	184,536
Average cost of fuel per gallon ..		\$0.1216	Miles per gallon of oil ..			160.5
Average cost of oil per gallon ..		\$0.4727	Fuel cost per mile ..			\$0.03947
Average miles per truck per mo. ..		4,613	Oil cost per mile ..			\$0.00294
Average miles per truck per day ..		153	Repair cost per mile ..			\$0.01689
Miles per gallon of fuel ..		3.70				
			Total cost per mile ..			\$0.05930

\* Sterling Truck FC-135 Model, with an AB Waukesha gasoline motor, pulling six-wheel, 10-ton trailer. Weight of truck, empty, 15,645 lb.; Weight of trailer, empty, 10,500 lb.; Legal gross weight of truck and trailer, 68,000 lb.

TABLE 4

Relation of Basic Units for the Three Groups A-34, A-35, and B-34, as Recapitulated from Tables 1, 2, and 3 with the Addition of the Three Cost Factors Depreciation, Interest, and Insurance

Basic Units	Diesel Group A-35	Diesel Group A-34	Gasoline Group B-34	Average of A-35 and A-34
Average cost of fuel per gallon ..	\$0.0416	\$0.0351	\$0.1216	\$0.0383
Average cost of oil per gallon ..	\$0.4583	\$0.4653	\$0.4727	\$0.4618
Miles per gallon of fuel ..	5.93	6.10	3.70	6.01
Miles per gallon of oil ..	143.8	144.4	160.5	144.1
Fuel cost per mile ..	\$0.00702	\$0.00575	\$0.03947	\$0.00638
Oil cost per mile ..	\$0.00319	\$0.00322	\$0.00294	\$0.00321
Repair cost per mile ..	\$0.02200	\$0.02097	\$0.01689	\$0.02148
Totals ..	\$0.03221	\$0.02994	\$0.05930	\$0.03107
Depreciation * ..	\$0.02960	\$0.02960	\$0.02700	\$0.02960
Interest † ..	\$0.00396	\$0.00396	\$0.00366	\$0.00396
Insurance ‡ ..	\$0.00067	\$0.00067	\$0.00061	\$0.00067
Grand Total ..	\$0.06644	\$0.06417	\$0.09057	\$0.06530
Cost of gasoline truck per mile ..			\$0.09057	
Cost of diesel truck per mile ..			\$0.06530	
Differential in favor of diesel ..			\$0.02527	

\* Figured for life of 200,000 miles, less tires and 10 per cent junk value. † Interest figured on one-half investment, for four years. ‡ Insurance covers fire and theft only.

TABLE 5

Cost of Operating Diesel and Gasoline Equipment One Million Miles (Figures Obtained by Multiplying the Cost Per Mile From Table 4 by One Million) Also Increase or Decrease of Diesel Costs as Related to Gasoline-Equipment Cost

Basic Units	Diesel Truck	Gasoline Truck	Decrease	Increase	Per Cent Decrease or Increase
Cost of Fuel ..	\$6,380.00	\$39,470.00	\$33,090.00		—83.58
Cost of oil ..	3,210.00	2,940.00		\$270.00	+ 0.91
Cost of repairs ..	21,480.00	16,890.00		4,590.00	+27.11
Depreciation (200,000 miles) ..	29,600.00	27,000.00		2,600.00	+ 9.63
Interest (1/2 investment) ..	3,960.00	3,660.00		300.00	+ 8.19
Insurance (fire and theft) ..	670.00	610.00		60.00	+ 9.83
Total ..	\$65,300.00	\$90,570.00	\$33,090.00	\$7,820.00	—27.91
Deduct ..	\$90,570.00		\$7,820.00		
Net saving ..	\$25,270.00		\$25,270.00		—27.91

years of intensive development and improvement; whereas the automotive diesel is only in its fourth or fifth year of development—and only in its third year of intensive development—and is at the present time going through its formative stage.

It seems safe to assume that, under a larger scale of production, diesel motors will be produced at approximately the same cost as gasoline motors, so that there should be little difference in cost as reflected in the items for depreciation, interest on investment, and insurance. It is felt that in a very short time the maintenance cost of diesel equipment will be reduced to about the same level as the maintenance cost of gasoline-motored equipment. During the past year very pronounced changes have occurred in the design of connecting rods, pistons, liners, new types of valve-rocker arms, valve guards, valve rocks, valve keepers, and injectors. The old parts are being replaced with those of new design as fast as they are perfected and proved in the factory. This replacement, incidentally, has been charged to maintenance cost—and with perfection of design such cost will be appreciably reduced.

Twenty-five or seventy-five diesel engines in use by Pacific Freight Lines have been equipped with the new parts mentioned above, and a pronounced change in maintenance cost has resulted in the motors so far equipped. The experience with these new parts has not been of sufficient duration, however, to translate the saving into cost per mile.

**S**INCE maintenance cost in the operation of the automotive diesel engine is, and has been, such a moot question, it was felt that the check made over a four-month period might not be conclusive. An additional check was, therefore, made of 22 trucks—consisting of Sterlings, Macks, and Pierce-Arrows, equipped with Cummins diesel motors—for a period of 12 months. This equipment operated 1,462,344 miles, and the cost of repair parts and labor amounted to \$30,427.92, or a cost per mile of \$0.02086. In comparison, this cost for four months, for the 10 trucks shown in Table 1, is \$0.02097 per mile. For the 10 trucks, for the four months shown in Table 2, this cost is \$0.0220 per mile; and the average of this cost, as shown in Table 4, was \$0.02148. The difference between the maintenance cost per mile of this second miscellaneous group of trucks, calculated over the year, and the average obtained from Tables 1 and 2 is \$0.00062, which would amount to only \$620 for one million miles of operation. This would indicate that the study

of the four-month period is just as accurate as that conducted for the longer period, and that the study of the 10 trucks produced the same result as a study of the larger group of 22 trucks would have produced.

The relative cost of diesel operation vs. gasoline operation is shown graphically in Fig. 1, on page 14.

Fig. 1 gives a quick picture of the figures supplied by Table 5.

## They Switch Trailers

(CONTINUED FROM PAGE 17)

operate. The switch, it was decided, should be made at a joint terminal at 126 Emmett Street, Newark, N. J. On Jan. 4, 1932, the first trailer to be switched arrived at that terminal. The driver who received the trailer took his loadings, inspected the trailer for damage, signed for the load and proceeded on his way, and as far as these two companies know, history was made.

**W**ITH four years' experience behind them, these companies are still switching trailers at the same place in the same way. This new phase of this business has never given either a really anxious minute while it was growing from one scheduled trailer load per day to a business that averages from 50 to 100 tons per day and appears to be still more or less in its infancy. No unpleasantness has marred this profitable enterprise.

After the switching had been in operation for a time an alien trailer showed up with a flat tire. What was done? Just exactly what you would have done under the same circumstances. The tire was repaired in the affiliated company's shop and a note was sent to the other company advising it of the repair. This type of repair does not involve billing the other company because the amount is so small that it was believed reciprocity would be more economical. When a tire, in such condition that it cannot be repaired, shows up it is replaced and a note goes forward telling the owning company that its trailer No. 1 has a tire No. 2 belonging to the other company on it as a result of a necessary replacement. The tire is later returned.

When a repair or replacement is made in a foreign shop it is made as cheaply as possible to enable the trailer to get back to its home shop. If patchwork is bad judgment in the opinion of the shop man on the job, the work is done as it should be and the owning company is billed for what it costs the other company to do the work.

Both companies are enthusiastic about the operation and have the feeling that it will succeed just so long as it is on a friendly basis of complete confidence in the other fellow. After one year of operation they did some joint advertising on the service in the form of pamphlets. It is immediately pointed out to you, if you show any interest in the service, that a joint service of this kind makes it unnecessary for either company to pioneer a territory with a small volume of freight and a restricted number of trucks and employees. When a trucking line goes into a new territory it must of necessity start in a modest way because it would take a large amount of capital and willingness to operate at a loss for a time to be able to offer the facilities of a company already in full bloom. For instance, Pyramid offers Philadelphia shippers the best service Consolidated can give with its approximately 300 trucks already operating in the New-England territory. Consolidated offers New England shippers the promptness and reliability of the Pyramid organization with its 100 trucks in the New York south to Philadelphia portion of the Atlantic seaboard.

After four years of experience the interested parties believe that the operation could be duplicated on the same basis any place where there are two points of shipping concentration that would give the participating lines a reasonable chance of keeping the two directions of the traffic-flow balanced. When there is an unscheduled shipment on this operation the office of origin immediately makes the fact known in New York by means of teletype so that arrangements to handle the extra load can be completed by the time the load arrives at Newark. But for the most part the loads balance one another, which means that the trailers get home on the following day laden with freight that would otherwise have been unloaded and reloaded in New York.

**T**HE operation is not automatic, however. It requires more than an idea. It requires some practical truck operation. Pyramid initiated the same type of service with a line which hauls in another direction. It did not work out satisfactorily and Pyramid discontinued it quickly. Pyramid believes it did not succeed for the reason that there was no consistent cooperation between the two companies.

An unexpected advantage came out of the through trailer operation. The solicitors in Philadelphia territory were able to swap leads with the New England solicitors and that acted as a tonic for the business of both companies.

# No Brake

on earth can  
stop a truck as

# FAST

and as smooth

as **ELECTRIC  
BRAKES**

ELECTRICITY  
TRAVELS AT  
A SPEED OF  
186,000 MILES  
PER SECOND

## HERE'S WHY..

● The moment the driver presses the foot pedal, the electric current from the generator or battery arrives at the brakes, and applies them.

Quicker than the flick of an eye-lash, the current flows equally to each wheel.

If only a fraction of a second need be saved to avert an accident, electric brakes will prevent that accident.

This is a main reason why so many big operators from coast to coast are using electric brakes in preference to any other kind.

Write for circular furnishing complete information regarding product and nearest distributor

**Always Equalized  
No Adjustment Needed**

# ELECTRIC BRAKES

MADE BY WARNER ELECTRIC BRAKE  
MANUFACTURING CO. • BELOIT, WISCONSIN

Costs Less To  
Install Than  
Any Other  
Power Brake

Takes Less  
"Juice" Than  
a Tail Light



## T-MEN AT NEWARK AIR DEVELOPMENTS

(Continued from Page 26)

oped. Mr. Werner's next question was, "Where can we procure and who makes axles, drive lines, etc., for diesel engines?"

Mr. Young, Mack Trucks, Inc., said, "I see no reason why diesel replacements should not be made in trucks that have seen service if the two engines have approximately the same number of cubic inches displacement." Earlier Mr. Kelley had cited the fact that the Mack bus equipped with a diesel engine for the Dave Evans Transcontinental run several years ago had broken two axle shafts during the run. In answer to this Mr. Young stated, "The units in that bus were designed for a 475-cu. in. engine and the diesel engine that replaced it had about 670 cu. in."

**I**N the opening session O. M. Brede, director of service, General Motors Truck Co., outlined a complete plan that General Motors Truck Co. has developed for maintaining fleets. The preventive maintenance operations suggested were positive but Mr. Brede made it clear that mileages for performance of these operations could only be suggested until such time as an individual fleet made sufficient study to enable the operator to determine which mileage intervals best fitted the individual fleet.

Covering the subject in a general way before going into details Mr. Brede said, "Until repairs are made by facts rather than by guess; until the question 'why this failure' takes precedence over 'just repairing,' the serious service problem cannot be solved. The aim and objective of maintenance should be primarily to prevent repairs."

S. Ward Widney, director of engineering, B & J Spring Co., speaking on the subject of springs and tires, described the Ride-O-Graph, a device with which reliable tests are made of the effectiveness of tires, springs and shock absorbers. Mr. Widney said, "The curves produced by this machine are simple space-time curves and we now know how to interpret these curves quickly and accurately. The information thus obtained presents a true picture of the comparative effectiveness of springs, tires and shock absorbers as they affect the rideability and roadability of the vehicle."

Mr. Widney indicated that his comparative study of springs has made it possible to reduce maintenance costs as much as 32 per cent by installation of springs and shock absorbers that had desirable characteristics.

At the banquet Joseph B. Eastman, Federal Coordinator of Transportation, discussed the Motor Carrier Act informally and sounded the warning that the future of common carrier transportation depended upon the ability of the common carrier to keep the cost of transportation to the user below that of moving his own goods or passengers in his own vehicles. Mr. Eastman stated that "railroads requested that motor carriers be regulated, but the motor carriers themselves demanded that they be regulated."

Fred MacRae, chairman of the legislative committee of the New Jersey Motor Truck Association, said in his talk that there was a fifty-million-dollar diversion of highway funds in the state of New Jersey alone and he gave a breakdown of this diversion. Mr. MacRae gave figures to indicate that 40 to 50 per cent of all highway income came from trucks in New Jersey.

**ROY F. BRITTON**, director of the National Highway Users' Conference, said that the motor transportation industry was "over-taxed and over-regulated." He held that the Motor Carrier Act had great promise and said, "If it establishes the financial responsibility of public carriers; if it assures fair and just rates to shippers and prohibits discrimination; if it brings about uniformity of regulation; if it encourages the full development of motor transportation in its own right, it will be universally applauded and it will be successful. But there are too many ifs and the pitfalls are all too apparent."

To illustrate the inequality of state regulations Mr. Britton cited the fact that a manufacturer 30 miles away from New York in Connecticut would have to use three trucks to move 30 tons per day, where a plant 30 miles from New York in New Jersey could move the tonnage with two trucks because of the difference in state laws. In addition the savings lost to the Connecticut manufacturer, Mr. Britton points out that three trucks congest the highways more than two trucks.

"The greatest difficulty will be to regulate for-hire carriers without encroaching on the rights of private carriers such as farmers, merchants and other enterprises which operate their trucks as plant facilities."

Using a recent act of the Texas legislature as an example, Mr. Britton pointed out that in a zealous effort to protect for-hire carriers it is possible to restrict private operation. The Texas law states that merchants cannot deliver



J. F. Winchester, Supervisor of Motor Equipment, Standard Oil Co., N. J.

their own goods in their own trucks to their customers in other towns and add a delivery charge unless the trucks are operating as contract carriers with permits from the Railroad Commission, which permits are rarely granted.

**MORE** than 11,000 people attended the Motor Truck Show which was sponsored by the New Jersey Motor Truck Association and the Newark Chamber of Commerce in cooperation with the Metropolitan Section of the S.A.E. More than 1100 men attended the technical sessions and this figure does not include the attendance at the safety rally which was held simultaneously with one of the sessions.

The exhibits of 43 manufacturers filled the Newark Center Market Building. The value of the highway transportation exhibits was about one and one-half million dollars. Various specialized bodies exhibited by truck manufacturers on different chassis, the new diesel engines of less than 300-cu. in. displacement and the light camel-back chassis seemed to be the best attention-getters, although most of the show visitors worked their way carefully through the show examining all that was offered.

### Flexible Clearance Lamp

**T**HE Swa-Bac clearance lamp is said to be vibration proof, waterproof, and dustproof, since the entire body is made of rubber. The angle bracket is reinforced with steel which brings the lamp back to its normal vertical position whenever an impact causes the body to sway backward or forward. The interior of the lamp is claimed to be so completely sealed that water and dust cannot accumulate on the bulb or on the inside of the lens. List price \$.50 each.

The Do-Ray Lamp Co. of 1458 S. Michigan Ave., Chicago, Ill., makers of this lamp, are also marketing an improved 3-way light for trucks. Features include bakelite insulating strip backed by a heavy piece of live rubber which holds the wiring assembly in positive contact at all times. List price \$1.50 each.

*had one on low  
2500s*





[illegible]





Line Number	MAKE AND MODEL	GENERAL (See Keynote)			TIRE SIZES		ENGINE DETAILS				TRANSMISSION		REAR AXLE		FRONT AXLE	BRAKES		BODY DATA		FRAME						
		Rating	Chassis Price	Standard Wheelbase	Max. Wt. Vehicle	Standard	Dual rear	No. of Cylinders	Displacement	Comp. Ratio	Torque lb. ft.	Max. Brake H.P. at 2000 R.P.M.	Main Bearings	Governor Standard		Make and Model	Gear and Type	Drive & Torque	Make and Model		Location	Lining Area	Drum	Hand Location	Width of Frame	Side Rail Dimensions
1	Ford	511 1/2	600	131	157	3220	6.00/20S	32x7	6.00/16	32x7	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a
2	Commercial	511 1/2	360	112	112	3297	6.00/16S	6.50/16	32x7	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
3	Gen. Mot. (2) T-10	511 1/2	595	131	157	3220	6.00/20S	7.00/20	32x7	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
4	Gen. Mot. (2) T-10	511 1/2	777	131	157	3220	6.00/20S	7.00/20	32x7	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
5	Gen. Mot. (2) T-10	511 1/2	1655	142	184	3000	4.25/20	34x7	20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
6	Gen. Mot. (2) T-10	511 1/2	1795	142	184	3000	4.25/20	34x7	20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
7	Gen. Mot. (2) T-10	511 1/2	2285	142	184	3000	4.25/20	34x7	20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
8	Gen. Mot. (2) T-10	511 1/2	2285	142	184	3000	4.25/20	34x7	20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
9	Gen. Mot. (2) T-10	511 1/2	2285	142	184	3000	4.25/20	34x7	20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
10	Gen. Mot. (2) T-10	511 1/2	2285	142	184	3000	4.25/20	34x7	20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
11	Gen. Mot. (2) T-10	511 1/2	2285	142	184	3000	4.25/20	34x7	20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
12	Gen. Mot. (2) T-10	511 1/2	2285	142	184	3000	4.25/20	34x7	20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
13	Gen. Mot. (2) T-10	511 1/2	2285	142	184	3000	4.25/20	34x7	20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
14	Gen. Mot. (2) T-10	511 1/2	2285	142	184	3000	4.25/20	34x7	20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
15	Gen. Mot. (2) T-10	511 1/2	2285	142	184	3000	4.25/20	34x7	20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
16	Gen. Mot. (2) T-10	511 1/2	2285	142	184	3000	4.25/20	34x7	20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
17	Gen. Mot. (2) T-10	511 1/2	2285	142	184	3000	4.25/20	34x7	20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
18	Gen. Mot. (2) T-10	511 1/2	2285	142	184	3000	4.25/20	34x7	20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
19	Gen. Mot. (2) T-10	511 1/2	2285	142	184	3000	4.25/20	34x7	20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	350 a	
20	Gramm.	Ax4-1 1/2	785	131	180	1100	3550	6.00/20-S	7.50/20	Con W10	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
21	Gramm.	Ax4-1 1/2	865	131	180	1200	3550	6.00/20-S	7.50/20	Con W10	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
22	Gramm.	Ax4-1 1/2	995	131	210	1250	3700	6.00/20	8.25/20	Con W10	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
23	Gramm.	Ax4-1 1/2	1495	131	210	1250	3700	6.00/20	8.25/20	Con W10	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
24	Gramm.	Ax4-1 1/2	1695	140	210	1400	4300	6.50/20	9.00/20	Con W20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
25	Gramm.	Ax4-1 1/2	1995	140	210	1400	4300	6.50/20	9.00/20	Con W20	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
26	Gramm.	Ax4-1 1/2	2095	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
27	Gramm.	Ax4-1 1/2	2095	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
28	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
29	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
30	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
31	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
32	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
33	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
34	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
35	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
36	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
37	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
38	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
39	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
40	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
41	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
42	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
43	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
44	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
45	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
46	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
47	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
48	Gramm.	Ax4-1 1/2	2395	160	224	1400	4820	7.50/20	9.00/20	Her JXC	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
49	Hahn.	HB-2	1245	184	100	1200	3000	7.00/20	32x6	Wau 6BK	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
50	Hahn.	HB-2	1770	184	100	1200	3000	7.00/20	32x6	Wau 6BK	80-3800	3-2 1/2	N	4 Owa	3.8	14-9	1.4	4 Owa	3.8	350 a	350 a	350 a	350 a	350 a	350 a	
51	Hahn.	HB-2	2095	184	100	1200	3000	7.00/20	32x6																	



Model	Year	Price	Weight	Chassis	Engine	Transmission	Drive	Options	Notes
80	1980	14,100	1,200	400	4	4	4	4	4
81	1981	14,100	1,200	400	4	4	4	4	4
82	1982	14,100	1,200	400	4	4	4	4	4
83	1983	14,100	1,200	400	4	4	4	4	4
84	1984	14,100	1,200	400	4	4	4	4	4
85	1985	14,100	1,200	400	4	4	4	4	4
86	1986	14,100	1,200	400	4	4	4	4	4
87	1987	14,100	1,200	400	4	4	4	4	4
88	1988	14,100	1,200	400	4	4	4	4	4
89	1989	14,100	1,200	400	4	4	4	4	4
90	1990	14,100	1,200	400	4	4	4	4	4
91	1991	14,100	1,200	400	4	4	4	4	4
92	1992	14,100	1,200	400	4	4	4	4	4
93	1993	14,100	1,200	400	4	4	4	4	4
94	1994	14,100	1,200	400	4	4	4	4	4
95	1995	14,100	1,200	400	4	4	4	4	4
96	1996	14,100	1,200	400	4	4	4	4	4
97	1997	14,100	1,200	400	4	4	4	4	4
98	1998	14,100	1,200	400	4	4	4	4	4
99	1999	14,100	1,200	400	4	4	4	4	4
100	2000	14,100	1,200	400	4	4	4	4	4



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5174.6335110-23007-3x13/4

0.50/24	Wau RB	6-010%
0.50/24	Wau SRK	6-4 1/2 x 5

224	26000	9350	10.50/20D
231	30000	10500	10.50/20D
224	30000	10000	10.50/20D

... (C.O.E./K	7 1/4	5450	205
... 335RW9	7 1/4	6350	210
... 75RH	7 1/4	5150	203

† Donates new model or change in specifications  
\*Only one ratio  
†† — Ratios other than standard at extra cost



[illegible]



See Prices ready next issue \*\* Only one ratio. (a) Chassis weight includes cab. (b) Available with Diesel engine. (c) Available with Hesselman engine. Hus \*—Ratios other than standard at extra cost † Denotes new model or change in specifications

Model	Year	Chassis	Engine	Transmission	Drive	Weight	Price	Notes
80 FWD	1935	Model 80	4-10-15	4-10-15	4-10-15	10,500	12,500	
81	1935	Model 81	4-10-15	4-10-15	4-10-15	10,500	12,500	
82	1935	Model 82	4-10-15	4-10-15	4-10-15	10,500	12,500	
83	1935	Model 83	4-10-15	4-10-15	4-10-15	10,500	12,500	
84	1935	Model 84	4-10-15	4-10-15	4-10-15	10,500	12,500	
85	1935	Model 85	4-10-15	4-10-15	4-10-15	10,500	12,500	
86	1935	Model 86	4-10-15	4-10-15	4-10-15	10,500	12,500	
87	1935	Model 87	4-10-15	4-10-15	4-10-15	10,500	12,500	
88	1935	Model 88	4-10-15	4-10-15	4-10-15	10,500	12,500	
89	1935	Model 89	4-10-15	4-10-15	4-10-15	10,500	12,500	
90	1935	Model 90	4-10-15	4-10-15	4-10-15	10,500	12,500	
91	1935	Model 91	4-10-15	4-10-15	4-10-15	10,500	12,500	
92	1935	Model 92	4-10-15	4-10-15	4-10-15	10,500	12,500	
93	1935	Model 93	4-10-15	4-10-15	4-10-15	10,500	12,500	
94	1935	Model 94	4-10-15	4-10-15	4-10-15	10,500	12,500	
95	1935	Model 95	4-10-15	4-10-15	4-10-15	10,500	12,500	
96	1935	Model 96	4-10-15	4-10-15	4-10-15	10,500	12,500	
97	1935	Model 97	4-10-15	4-10-15	4-10-15	10,500	12,500	
98	1935	Model 98	4-10-15	4-10-15	4-10-15	10,500	12,500	
99	1935	Model 99	4-10-15	4-10-15	4-10-15	10,500	12,500	
100	1935	Model 100	4-10-15	4-10-15	4-10-15	10,500	12,500	
101	1935	Model 101	4-10-15	4-10-15	4-10-15	10,500	12,500	
102	1935	Model 102	4-10-15	4-10-15	4-10-15	10,500	12,500	
103	1935	Model 103	4-10-15	4-10-15	4-10-15	10,500	12,500	
104	1935	Model 104	4-10-15	4-10-15	4-10-15	10,500	12,500	
105	1935	Model 105	4-10-15	4-10-15	4-10-15	10,500	12,500	
106	1935	Model 106	4-10-15	4-10-15	4-10-15	10,500	12,500	
107	1935	Model 107	4-10-15	4-10-15	4-10-15	10,500	12,500	
108	1935	Model 108	4-10-15	4-10-15	4-10-15	10,500	12,500	
109	1935	Model 109	4-10-15	4-10-15	4-10-15	10,500	12,500	
110	1935	Model 110	4-10-15	4-10-15	4-10-15	10,500	12,500	
111	1935	Model 111	4-10-15	4-10-15	4-10-15	10,500	12,500	
112	1935	Model 112	4-10-15	4-10-15	4-10-15	10,500	12,500	
113	1935	Model 113	4-10-15	4-10-15	4-10-15	10,500	12,500	
114	1935	Model 114	4-10-15	4-10-15	4-10-15	10,500	12,500	
115	1935	Model 115	4-10-15	4-10-15	4-10-15	10,500	12,500	
116	1935	Model 116	4-10-15	4-10-15	4-10-15	10,500	12,500	
117	1935	Model 117	4-10-15	4-10-15	4-10-15	10,500	12,500	
118	1935	Model 118	4-10-15	4-10-15	4-10-15	10,500	12,500	
119	1935	Model 119	4-10-15	4-10-15	4-10-15	10,500	12,500	
120	1935	Model 120	4-10-15	4-10-15	4-10-15	10,500	12,500	
121	1935	Model 121	4-10-15	4-10-15	4-10-15	10,500	12,500	
122	1935	Model 122	4-10-15	4-10-15	4-10-15	10,500	12,500	
123	1935	Model 123	4-10-15	4-10-15	4-10-15	10,500	12,500	
124	1935	Model 124	4-10-15	4-10-15	4-10-15	10,500	12,500	
125	1935	Model 125	4-10-15	4-10-15	4-10-15	10,500	12,500	
126	1935	Model 126	4-10-15	4-10-15	4-10-15	10,500	12,500	
127	1935	Model 127	4-10-15	4-10-15	4-10-15	10,500	12,500	
128	1935	Model 128	4-10-15	4-10-15	4-10-15	10,500	12,500	
129	1935	Model 129	4-10-15	4-10-15	4-10-15	10,500	12,500	
130	1935	Model 130	4-10-15	4-10-15	4-10-15	10,500	12,500	
131	1935	Model 131	4-10-15	4-10-15	4-10-15	10,500	12,500	
132	1935	Model 132	4-10-15	4-10-15	4-10-15	10,500	12,500	
133	1935	Model 133	4-10-15	4-10-15	4-10-15	10,500	12,500	
134	1935	Model 134	4-10-15	4-10-15	4-10-15	10,500	12,500	
135	1935	Model 135	4-10-15	4-10-15	4-10-15	10,500	12,500	
136	1935	Model 136	4-10-15	4-10-15	4-10-15	10,500	12,500	
137	1935	Model 137	4-10-15	4-10-15	4-10-15	10,500	12,500	
138	1935	Model 138	4-10-15	4-10-15	4-10-15	10,500	12,500	
139	1935	Model 139	4-10-15	4-10-15	4-10-15	10,500	12,500	
140	1935	Model 140	4-10-15	4-10-15	4-10-15	10,500	12,500	
141	1935	Model 141	4-10-15	4-10-15	4-10-15	10,500	12,500	
142	1935	Model 142	4-10-15	4-10-15	4-10-15	10,500	12,500	
143	1935	Model 143	4-10-15	4-10-15	4-10-15	10,500	12,500	
144	1935	Model 144	4-10-15	4-10-15	4-10-15	10,500	12,500	
145	1935	Model 145	4-10-15	4-10-15	4-10-15	10,500	12,500	
146	1935	Model 146	4-10-15	4-10-15	4-10-15	10,500	12,500	
147	1935	Model 147	4-10-15	4-10-15	4-10-15	10,500	12,500	
148	1935	Model 148	4-10-15	4-10-15	4-10-15	10,500	12,500	
149	1935	Model 149	4-10-15	4-10-15	4-10-15	10,500	12,500	
150	1935	Model 150	4-10-15	4-10-15	4-10-15	10,500	12,500	
151	1935	Model 151	4-10-15	4-10-15	4-10-15	10,500	12,500	
152	1935	Model 152	4-10-15	4-10-15	4-10-15	10,500	12,500	
153	1935	Model 153	4-10-15	4-10-15	4-10-15	10,500	12,500	
154	1935	Model 154	4-10-15	4-10-15	4-10-15	10,500	12,500	
155	1935	Model 155	4-10-15	4-10-15	4-10-15	10,500	12,500	
156	1935	Model 156	4-10-15	4-10-15	4-10-15	10,500	12,500	
157	1935	Model 157	4-10-15	4-10-15	4-10-15	10,500	12,500	
158	1935	Model 158	4-10-15	4-10-15	4-10-15	10,500	12,500	
159	1935	Model 159	4-10-15	4-10-15	4-10-15	10,500	12,500	
160	1935	Model 160	4-10-15	4-10-15	4-10-15	10,500	12,500	
161	1935	Model 161	4-10-15	4-10-15	4-10-15	10,500	12,500	
162	1935	Model 162	4-10-15	4-10-15	4-10-15	10,500	12,500	
163	1935	Model 163	4-10-15	4-10-15	4-10-15	10,500	12,500	

Line Number	MAKE AND MODEL	GENERAL (See Keynote)				TIRE SIZES		ENGINE DETAILS										TRANSMISSION		REAR AXLE			FRONT AXLE	BRAKES			BODY DATA		FRAME									
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. Wt. B.	Gross Vehicle Weight with Max. Tires	Chassis Wt.	Standard Front and Rear	Maximum Tire Size	Furnished	Make and Model	No. of Cylinders	Stroke	Displacement	Comp. Ratio	Torque lb. ft.	Max. Brake H.P. at R.P.M.	Number, Diameter, Length	Governor Standard	Forward Spd's	Make and Model	Gear and Type		Drive & Torque	Gear Ratio	Range in High	Make and Model	Location		Type	Operat'n	Lining Area	Drum Material	Hand Location	C-A Dimens. (Std. W.B.)	Width of Frame	Side Rail Dimensions	
Electrics																																						
1	Brookway	50-E-1-1/4	1380	91	Op	2450	32x6S	32x6		GE Elec	6	4	112	1500	30x5S	32x6					Tim	53200H	2F	H	H	H	Tim	30000H	L4IH	248 a	248 a	CD	CD	100 1/2	34	5x6	5x6	CD
2	Brookway	50-E-1-1/4	1500	91	112	2850	30x5S	32x6		GE Elec	6	4	112	1500	30x5S	32x6					Tim	53200H	2F	H	H	H	Tim	30000H	L4IH	248 a	248 a	CD	CD	100 1/2	34	7 1/2 x 2 1/2	7 1/2 x 2 1/2	CD
3	Brookway	50-E-1-1/4	2400	136	Op	5500	6 30 x 20D	9 75 x 20D		West Elec	6	4	112	1500	30x5S	32x6					Wls	5000L	2F	H	H	H	Shu 15582B11	L4IH	365 a	365 a	CD	CD	112 1/2	34	5 1/2 x 3 1/2	5 1/2 x 3 1/2	CD	
4	Brookway	50-E-1-1/4	3650	148	Op	6700	9 75 x 20D	10 50 x 20		West Elec	6	4	112	1500	30x5S	32x6					Wls	72000L	2F	H	H	H	Shu 15582B11	L4IH	407 a	407 a	CD	CD	112 1/2	34	5 1/2 x 3 1/2	5 1/2 x 3 1/2	CD	
5	Brookway	50-E-1-1/4	4200	160	Op	8040	9 75 x 20D	10 50 x 20		West Elec	6	4	112	1500	30x5S	32x6					Wls	1337BH	2F	H	H	H	Shu 15582B	L4IH	500 a	500 a	CD	CD	124 1/2	34	5 1/2 x 3 1/2	5 1/2 x 3 1/2	CD	
6	Walker	400-LA-36 Cases (10)	1200	96	Op	2900	32x6S	32x6		Own Elec	6	4	112	1500	30x5S	32x6					Own		2F	H	H	H	Cla	B4IM	214 a	214 a	41	41	35 1/2	32	4 1/2 x 3 1/2	4 1/2 x 3 1/2	CD	
7	Walker	400-LA-36 Cases (10)	1200	96	Op	2500	32x6S	32x6		Own Elec	6	4	112	1500	30x5S	32x6					Own		2F	H	H	H	Cla	B4IM	214 a	214 a	41	41	35 1/2	32	4 1/2 x 3 1/2	4 1/2 x 3 1/2	CD	
8	Walker	400-LA-36 Cases (10)	1200	96	Op	2500	32x6S	32x6		Own Elec	6	4	112	1500	30x5S	32x6					Own		2F	H	H	H	Cla	B4IM	214 a	214 a	41	41	35 1/2	32	4 1/2 x 3 1/2	4 1/2 x 3 1/2	CD	
9	Walker	400-LA-36 Cases (10)	1200	96	Op	2500	32x6S	32x6		Own Elec	6	4	112	1500	30x5S	32x6					Own		2F	H	H	H	Cla	B4IM	214 a	214 a	41	41	35 1/2	32	4 1/2 x 3 1/2	4 1/2 x 3 1/2	CD	
10	Walker	400-LA-36 Cases (10)	1200	96	Op	2500	32x6S	32x6		Own Elec	6	4	112	1500	30x5S	32x6					Own		2F	H	H	H	Cla	B4IM	214 a	214 a	41	41	35 1/2	32	4 1/2 x 3 1/2	4 1/2 x 3 1/2	CD	
11	Walker	400-LA-36 Cases (10)	2650	126	Op	4200	32x6D	32x6		Own Elec	6	4	112	1500	30x5S	32x6					Own		2F	H	H	H	Tim	B4IM	396 a	396 a	41	41	60	32	5 1/2 x 3 1/2	5 1/2 x 3 1/2	CD	
12	Walker	400-LA-36 Cases (10)	2650	126	Op	4200	32x6D	32x6		Own Elec	6	4	112	1500	30x5S	32x6					Own		2F	H	H	H	Tim	B4IM	396 a	396 a	41	41	60	32	5 1/2 x 3 1/2	5 1/2 x 3 1/2	CD	
13	Walker	400-LA-36 Cases (10)	2880	126	Op	4500	36x8D	38x9		Own Elec	6	4	112	1500	30x5S	32x6					Own		2F	H	H	H	Tim	B4IM	470 a	470 a	41	41	109	32	6 1/2 x 3 1/2	6 1/2 x 3 1/2	CD	
14	Walker	400-LA-36 Cases (10)	3680	160	Op	6600	38x9D	40x10		Own Elec	6	4	112	1500	30x5S	32x6					Own		2F	H	H	H	Tim	B4IM	470 a	470 a	41	41	124	32	7 1/2 x 3 1/2	7 1/2 x 3 1/2	CD	

## 2,000,000 Miles And No Accidents

(CONTINUED FROM PAGE 27)

tive enough so they will appreciate it and work toward something better.

OUR safety drive starts at the safety meeting. Monthly safety meetings are held at each of our eight terminals, at which attendance is compulsory, as well as necessary for a driver to collect his yearly bonus. However, a man on duty or a man sick or not present for some other bona fide reason will not be counted absent.

The major part of a safety meeting is taken up with the reports of safety committees. A committee at each terminal comprised of employees serves as a jury in passing on the responsibility in an accident. The committee's report is made to the group as a whole, the accident is re-enacted and recommendations made as to how it could be prevented in the future. Safety engineers of the insurance company work with us, make inspections, follow trucks on the road, report unsafe driving practices, etc. Various safety bulletins are posted and each cab carries a safety warning of a different text each month.

Drivers are not penalized if they have a minor accident on which we pay no money. However, if they have as many as five of these accidents in a year, the yearly bonus is cut 50 per cent. It is necessary that a man work 75 per cent of his time actually driving in order to qualify as an operator. It is also necessary that he work an entire year as a driver to qualify for the yearly bonus.

COMPLETE rules of the safety contest and bonus system which we use are as follows:

Each month that a driver goes without an accident he receives a \$2 bonus.

If he drives 75 per cent of his working time for a year without an accident on which we pay money, he receives an additional bonus of \$10 at Christmas, making a total of \$34 a year in all per driver. The first year this was in effect, 39 drivers qualified. A great many men only missed by one month.

Failure to report an accident also deprives a man of his bonus. Every accident, regardless how trivial, must be reported. The report must be made in writing to the terminal manager immediately upon returning from a run. Should a controversy arise over an accident as to whether or not a driver should receive a bonus, the insurance company acts as the final judge.

Great emphasis is placed on preventive maintenance, for aside from the monetary loss in accidents, the loss of good-will because of delayed ship-

ments is even greater. We do not mean to convey the idea that our plan is perfect or that it is operating 100 per cent, but we are working toward 100 per cent performance and do not think it is out of the bounds of reason.

Our maintenance department is charged with careful inspection and complete mechanical safety. The inspections are made daily. Governors are checked on each vehicle to see that they are working properly so that dangerous driving speeds can not be attained. All trucks are equipped with dimming switches so that proper courtesy can be shown to other drivers on the road at night. Every trailer, since the first one we purchased in 1928, is equipped with power brakes. We have never at any time had a run of sufficient length that would overtax the driver's strength or energy. When a run is of such distance that it is impossible for him to return to his own station at night, comfortable sleeping quarters are provided and he has ample time for obtaining the proper rest. A driver on a road run is not compelled to do any actual loading or unloading of freight unless it is a short peddler run.

Flags and flares must be carried at all times. Each driver is issued two flags and flares which are charged to him and are his responsibility. We do not stand the fine of any law violation that is due to a driver's carelessness.

OUR operation includes 95 pieces of motor equipment and 23 business cars used by solicitors, officials, etc. We drive a minimum of 5000 miles per night exclusive of our local delivery trucks. We maintain strict overnight service from any point to any point on our line, and in connection with other carriers, we render service to the states of Michigan, Illinois, Kentucky, Indiana, and Ohio. Careful attention is given to our associate carriers as we assume full responsibility for a shipment until it is delivered.

We operate eight company terminals and numerous other stations where a local deliveryman is our agent. During the first ten months of 1934, tonnage averaged in excess of 18,000,000 lb. per month.

There is a tremendous fascination about safety work which, outside of the humanitarian angle involved and the knowledge of being of good to others, gives a very pleasing sense of personal satisfaction. The writer also has been very interested and active in American Legion work, stressing safety in Legion activities. Our local Post is sponsoring a campaign of safety education in the schools which we believe will bring highly gratifying results. We thereby aim to get the public to cooperate in promoting safety.





## ALUMINUM PAYS

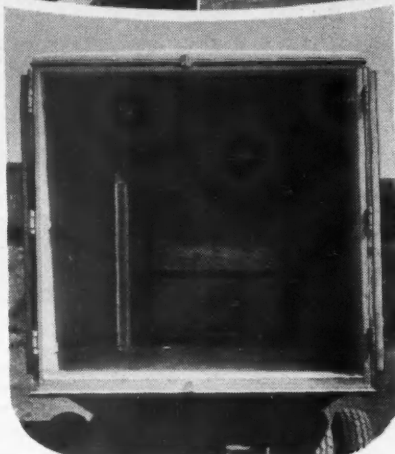
(CONTINUED FROM PAGE 21)

own conclusions. Factual data from these sources are presented here because evidence based on experience is always more enlightening than an academic discussion. The illustrations represent varied vocations.

**BRAUN BROTHERS AND CO.**, Pittsburgh, Pa., bakers, operates a  $1\frac{1}{2}$ -ton truck equipped with a 12 x 5 x 5 ft. aluminum body over a route of about 100 miles per day. The aluminum body on this truck weighs 1870 lb. complete with racks, pans, and shelving. The body it replaced weighed 3470 lb. Both bodies have the same capacity and with the aluminum body there is a reduction of 1600 lb. which makes the truck faster and speed is important on a bakery route and there is a saving in gasoline and oil.

Two 151-case aluminum bodies are used by the Coca Cola Co., Montgomery, Ala. The body weight is 550 lb. and the bodies replaced weighed 1650 lb. each but they had a capacity of only 126 cases. The 1100 lb. saved in body weight is just about equal to the weight of the additional 25 cases made possible by the aluminum bodies, so there is almost no difference in the gross weight or operating cost. The aluminum bodies cost \$170.50 each more than the steel ones but they haul 25 extra cases of beverage at no extra cost. The 25 cases if they had to be hauled as part of the next load would have cost about 5 cents each to haul. The aluminum bodies saved approximately \$1.25 per trip and in 137 trips paid for themselves.

**WITH** chassis selected the Stroh Brewery, Detroit, Mich., found that a wood and steel body would not permit them to carry what they considered a full payload of beer without overloading the tires and chassis. With the chassis equipped with aluminum bodies



The above are photos showing construction details, and the finished job of an aluminum semi-trailer milk body

which weighed 1500 lb. less than the proposed bodies which permitted them to carry 30 more cases of beer with no increase in gross load. The extra payload permitted the company to write off the cost of the bodies during one summer's operation and \$18.75 was saved in the license fee of each truck.

The Erickson Paving Co. operating in the state of Washington were operating six-wheel dump trucks, and their trucks weighed the maximum gross weight allowed by the state, which is 34,000 lb. without carrying a satisfactory load. They replaced the bodies they were using with aluminum dump bodies of the same size, which is 13 ft. 6 in. x 6 ft. 8 in. x 23 in., and in so doing saved 1670 lb. of body weight. The old bodies weighed 3900 lb. and the new ones 2230. This permitted the legal payload to be increased exactly 1670 lb.

A 45-minute schedule was cut to 25 minutes by the Fairfield Western Maryland Dairy after an old semi-trailer was replaced with a new one having an aluminum body which represented a total weight saving of 11,280 lb. The same tractor is used to pull the load

## OFF IN PAYLOADS

and the payload has not been changed.

An 18-cu. yd. coal body is used by J. J. Finnegan, a contract hauler for the New England Coal and Coke Co. Made of aluminum this body weighs 2650 lb. Built of steel it would weigh 4250, which is 1600 lb. more which would have to be cut off the payload.

An aluminum body identical for size with the steel body it replaced in the Miller North Broad Storage Co., Philadelphia, weigh 4270 against 7570 for the old body. Both bodies are 20 ft. long, 93½ in. wide and 7 ft. 8 in. high.

**UP** against the California gross weight limit of 34,000 lb. the load on a truck operated by the Sperry Flour Co., Los Angeles, was increased from 18,150 lb. to 19,810 lb. by reducing the body weight 1660 lb. by substituting an aluminum body for one made of wood and steel. Both bodies measure 18 ft. 1 in. long and 6 ft. 11 in. wide. The aluminum body weighs 2370 lb. against 4030 lb. for the wood and steel.

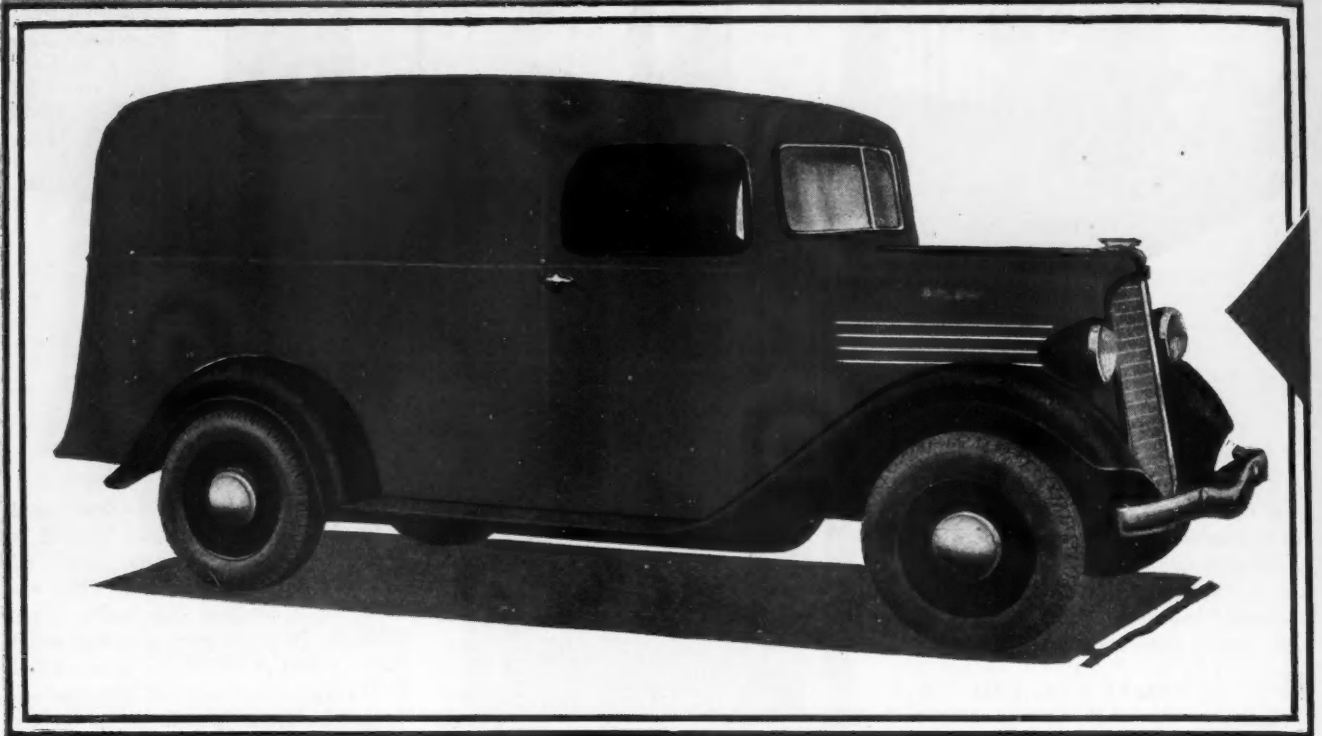
The City of Cincinnati uses three aluminum trailers with aluminum dump bodies for garbage collection. These units travel about 100 miles per day. The weight of the entire unit including tractor is 8500 lb. and the unit replaced weighed 13,500. Owing to the lighter gross weight a smaller tractor was used and the saving in cost was \$400 greater than the increased cost of the trailer unit. In addition the new units carry 8 cu. yd. instead of 6 cu. yd. which the others carried.

An aluminum rack and panel body in the service of the Corn Products Refining Co., used for hauling syrup in bulk, weighs 1750 lb., which is 4580 lb. less than the body it replaced. Increased payload replaced the body weight and the payload jumped from 11,360 to 13,930 lb., which figures out 22.69 per cent.

(TURN TO PAGE 60, PLEASE)



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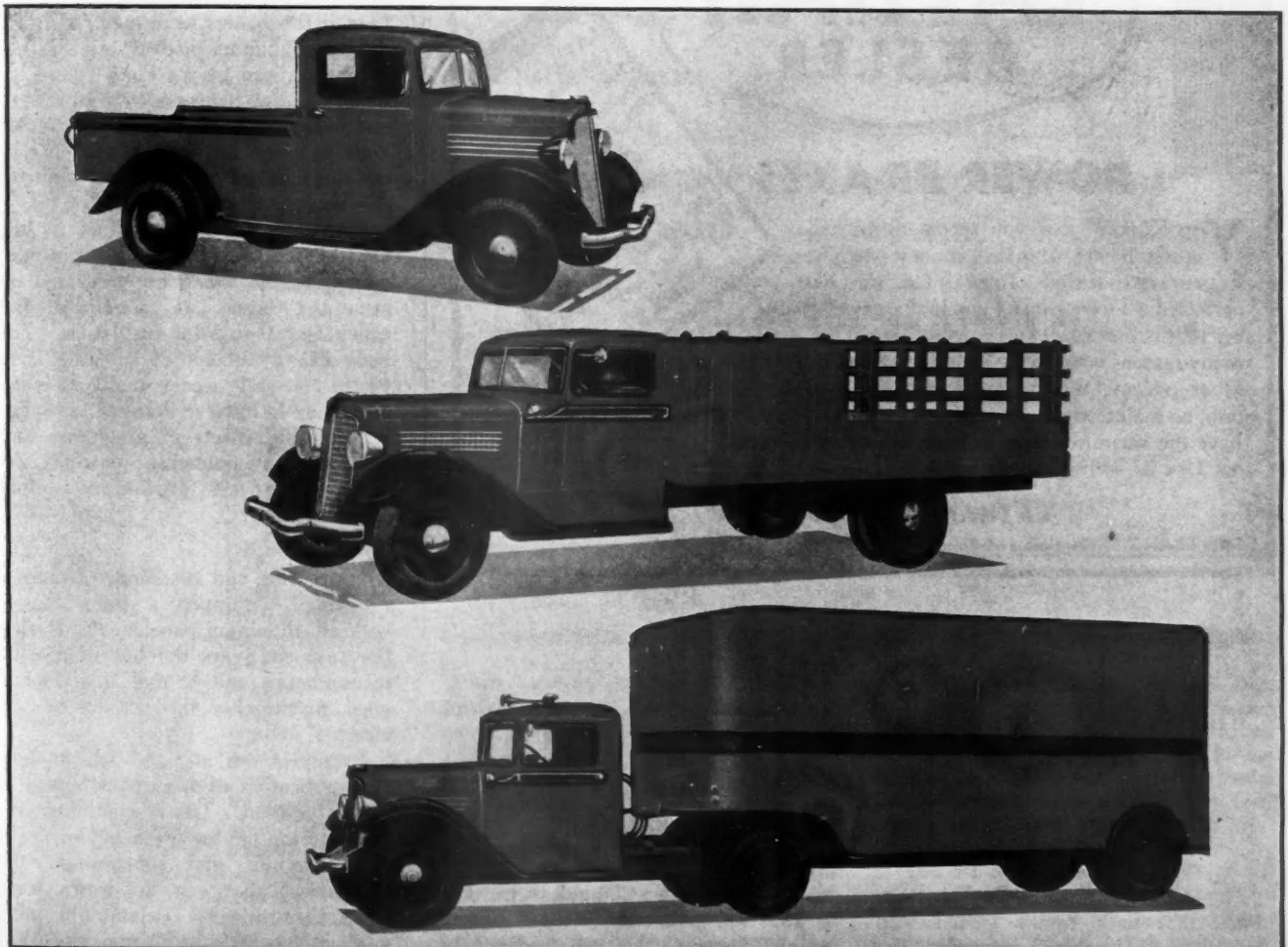
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Cross section of LATHAN-BESLER diaphragm-type power-chamber in action. Note how this LATHAN-BESLER construction ELIMINATES FRICTION, and transmits FULL power DIRECT to the brake mechanism—in EQUAL measure.

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 for every truck and trailer. Package and fits as low as  
**\$25 LIST**  
 New LATHAN-BESLER catalog now out. Write for a copy TODAY!

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press Co., Reading, Pa., placed in silk-hauling service two trucks with aluminum chassis frames, fenders, hoods, splashers, bullet proof cabs as well as aluminum bodies. These truck chassis weighed 1432 lb. less than the chassis they replaced and the aluminum bodies saved 300 lb. each. This saving made possible an increase in payload from 14,000 lb. to 16,223 lb. The additional cost of the aluminum was paid off in one year as a result of the savings in operating cost.

The Baltimore Transfer Co. was the first to build and use a successful aluminum monocoque semi-trailer. This company now operates 30 such trailers. The chassisless unit is 18 ft. long, 7 ft. 6 in. wide and 6 ft. 6 in. high and weighs 3705 lb. with running gear and tires. It replaces units of conventional design that weighed 6350.

THE Brinks Express Co. operates 62 aluminum armored bodies for the transportation of money. By the use of aluminum alloy it is possible to reduce the weight and increase the speed without diminishing the protective thickness of the armor plate. In addition, it is possible to use lighter chassis than if the bodies were made of steel.

Two aluminum bodied semi-trailers are being used by the Long Island Ice Corp. These bodies are 26 x 8 x 4 ft. and weigh 4950 lb. There is no similar body in steel for weight comparisons but these bodies are unusually light for this size.

Packaged ice is distributed by the Central Ice and Storage Co. in aluminum bodies which are insulated by crumpled layers of aluminum foil which is called Alfof insulation. The body has a number of separate compartments and access to these compartments is by rear doors. Air space between the sheets of aluminum and lack of communicating passages between air spaces provide a twofold barrier to heat.

SOME time ago the Model Laundry, Cincinnati, equipped a light chassis with an aluminum panel body. During the next six years the body outlasted three chassis and at that time looked good for another three years of service.

Examples are at hand which show the application of aluminum bodies in every vocation. These examples corroborate the figures given in the previous examples and substantiate the conclusions that can be drawn from these illustrations of aluminum body applications. The bodies described are the products of many body builders and some of them were built in fleet body shops.

## Fleets Find Aluminum Pays Off in Payloads

(CONTINUED FROM PAGE 57)

The Charles Sucher Packing Co. found that their trucks loaded with 20,000 lb. of payload exceeded the highway load limits and by replacing a 6,000 lb. wood and steel body with a 2,500 lb. aluminum body they were

able to add 3500 lb. to their payload, which brought it up to 20,000 lb.

To obtain maximum gallonage possible under the North Carolina 40,000-lb. law the Quality Oil Co., Winston-Salem, replaced the 3750-gal. tanks with 4000-gal. aluminum tanks. The weight of the extra 250 gal. of gasoline is 1550 lb., just exactly the saving in weight between the two bodies, the figures being 3775 lb. for the aluminum and 5325 lb. for the steel tank.

In 1932 the Bingaman Motor Ex-



## New Products On Parade

(CONTINUED FROM PAGE 33)

### Alemite Lubricator

**T**HE Alemite Corp., a division of Stewart-Warner Corp., Chicago, Ill., recently introduced an air operated barrel pump designed to convert 100-lb. lubricant container into a powergun for truck fleet lubrication. Utilizing a nitralloy piston, a low pressure pump carries a continuous flow of lubricant from the container to a high pressure pump, where it is delivered at a rate of 18 ounces per minute. A pressure 33 times the air pressure used, is available to furnish a delivery sufficient for several outlets at one time.



In addition to this high pressure barrel pump, a line of Alemite specialized lubrication guns has been developed for truck service.

### Federal-Mogul Indicator

**C**ONNECTING rods after long and severe service frequently become distorted at the bearing bore, causing an out-of-round condition. If new insert bearings are installed in such rods, they will conform to this same out-of-roundness, with consequent binding and short life. To enable the mechanic to check for this condition, the Federal-Mogul Corp., Detroit, Mich., has developed a connecting rod indicator which is said to reveal any harmful bearing condition that may exist. Measure-



ments are taken on this indicator between two fixed, hardened, ball-pointed pins and one movable pin. This three-point contact makes the instrument self-centering. Bores ranging in size from  $1\frac{1}{4}$  to  $3\frac{1}{4}$  inches can be checked. It is also possible to check holes as small as  $\frac{5}{8}$  in.

DECEMBER, 1935

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Makes Costly Maintenance of Vacuum Unnecessary  
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**AMERICAN DIE AND TOOL COMPANY**  
Reading Pennsylvania

### Goodyear Stop-Start Tire

**T**HE Goodyear Tire & Rubber Co. of Akron, Ohio, has recently introduced a new tire, known as the "Stop-Start," a name which indicates the type of service for which it was especially designed. It is adapted for use on trucks in local freight hauling and express service where the speed averages 35 to 45 m.p.h.

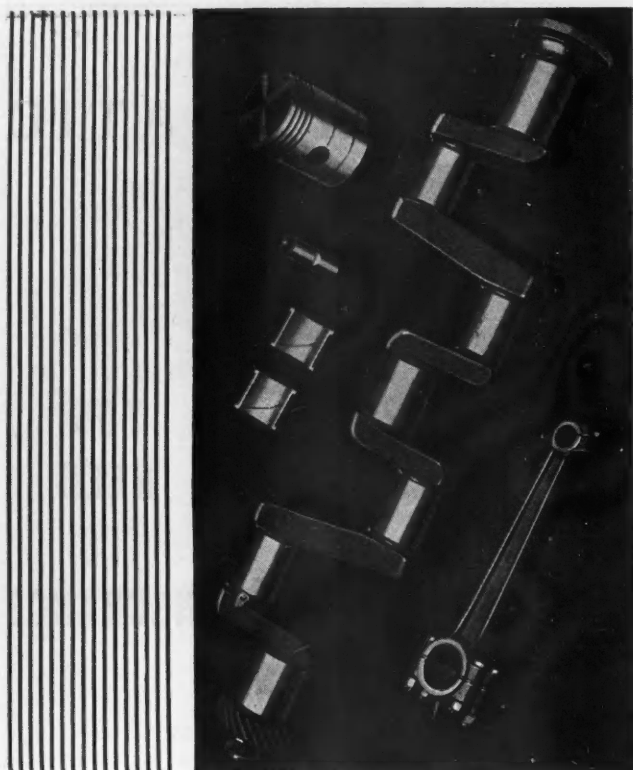
The tread of this tire is plainer and the shoulders have deeper cut notches to dissipate what heat generates in service. In addition, the non-skid portion of the tread is said to be 30 per cent deeper than in standard tires. The "Stop-Start" tire is available in the full range of sizes.

### C. T. & E. Directional Signal

**T**HE Connecticut Telephone and Electric Corp., Meriden, Conn., is marketing a directional signal device for mounting on trucks, both front and rear. When not lighted the metal face of the lamp appears black, but when the switch is on, an indicating arrow shows a bright amber color to the on-coming traffic.

The control switch is clamped to the steering column just below the wheel, providing finger-tip control. A tell-tale pilot light embedded in the switch housing, informs the driver of any failure in the signal system.

(TURN TO PAGE 93, PLEASE)



## For Fleet Protection

The vitals of the modern automobile engine must function under increasingly gruelling conditions. Protection of these parts is essential.

Fleet owners should be especially interested in seeing that their trucks go out with every precaution taken to insure good performance.

An important step in this direction is the use of an adjunct oil containing "dag"\* Brand colloidal graphite. No matter how carefully machined, ground or honed the friction parts have been, they are still surprisingly rough. With the use of Acheson's colloidal graphite, a smooth, self-lubricating graphoid surface is established on the parts. This surface reduces metal-to-metal contact during cold starting and when oil film rupture occurs due to high temperatures and heavy pressures.

Write for Bulletin S242 discussing the use of this material with alloy bearings.

\*Reg. U. S. Pat. Off.



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**COLLOIDS CORPORATION**  
 FOUNDED [1908] AS ACHESON OILDAG COMPANY  
 PORT HURON • MICHIGAN

## BLOOD BROTHERS MACHINE COMPANY announce

**New Series "N" Needle  
 Bearing Joints  
 Four Sizes: 4N-5N-6N-7N**



## Featuring:

1. Higher Angularity
2. Sealed Lubrication
3. Best Grade Alloy Steels
4. Most Accurate Workmanship
5. True Running Assemblies
6. Greater Ease in Assembling
7. Longer Slip Action
8. Greater Torque Capacity for Comparative Sizes

In designing the new Series "N" Joints, a sincere and successful effort has been made to produce the finest quality Universal Joint assemblies that experience, modern facilities and the best materials obtainable will permit.

Our design is such that plain yokes can be used as easily from an assembly standpoint as flange yokes and companions. We are prepared, however, to furnish all conventional types of flange construction where required.

Our Engineers are anxious to study your joint requirements and quote prices. Complete engineering data will be mailed to you promptly at your request.

**BLOOD BROTHERS  
 MACHINE COMPANY**  
 ALLEGAN MICHIGAN



## Delivering Skyscrapers by Truck

(CONTINUED FROM PAGE 19)

causing serious trouble, too. Obstruction to the operations of street cars and taxicabs means definite loss of money. A ten-minute blockade of any downtown business street in Chicago at almost any time of day would throw traffic into such a snarl that hours would be required to unravel it. Storekeepers have to be thought of. They can't afford to have access to their places barricaded. And then there are thousands of people on the streets, some of whom will be dead certain to do something foolish at the wrong moment.

"All this faintly suggests why the moving business, so far as the Pennoyer company is involved, is a matter of considerable community interest. For one thing we're obliged to maintain an annual bond of \$20,000 with the city of Chicago to cover possible damage to pavements or other public property if a beam should become unmanageable in transit or while being raised to position.

"And since the traffic problem is so acute, we are unable to operate without the closest coordination of all interests involved. When a building is under construction for which we are doing the hauling, we organize a board of strategy on which the street car company and police traffic officials are represented. A schedule is worked out and a temporary permit granted to move a load or two. Adjustments in arrangements may be found necessary and not until everybody is satisfied do we get a final permit to go ahead. At present we are not allowed to barricade sidewalks except at night and this complication calls for special lighting arrangements to minimize the risks inherent in work after dark."

It was in 1891 that the Pennoyer company woke up to the fact that its specialized service of hauling heavy building material was something to talk about. Orchestra Hall, the city's memorial to its great musical leader, Theodore Thomas, was being built on Chicago's show street, Michigan Avenue, and the architects and builders were making what seemed, then, like daring use of steel and concrete. The heaviest beam in the house was a 30-ton girder and it was a bit of a civic event when the Pennoyer company hauled the huge load up the avenue from the railroad tracks.

"It was the heaviest load we had ever tackled up to that time," said Mr. Koepke. "When the iron workers had set the last rivet which insured a per-

## The Dearborn Line CAB-OVER-ENGINE FOR FORD TRUCKS



THE DEARBORN DE LUXE

CLEAN, FLOWING LINES, *without a freakish feature*, distinguish the Dearborn Deluxe Body. Sixteen feet of loading space, six feet ten from floor to roof on the 157" Ford Chassis with Dearborn Cab-over-Engine Conversion.

THE ULTIMATE in modern streamlined beauty with a third more loading space than ever before available on the 157" Ford Truck

and—THE PRICE IS RIGHT.

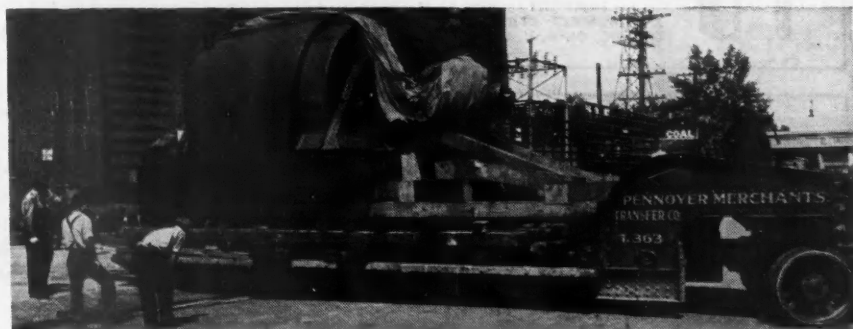
BODY LENGTHS—16' on the 157" W.B., 12' on the 131½", and 10' on the 112" Tractor Type Converted Truck.

ASK YOUR FORD DEALER, or write

**Transportation Engineers Incorporated**

15130 Woodward Avenue

Detroit, Michigan



This trailer of 100 tons capacity was specially built for hauling the 85-ton generator

fect job all around without a slip we felt that we had made a marvellous

record. A little later, however, we broke it by hauling a 40-ton beam for the

**3**  
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SPRING SUSPENSION**

Every Demonstration  
 Becomes a Sale

Write for bulletin

**B. & J. TRAILER CO.**  
 3915 S. Michigan Ave. Chicago

new city hall. Today our record stands at a 93-ton beam which was used in the Stevens Hotel.

"Like that first big girder in Orchestra Hall, this latter was a record-breaker from the architect's point of view as well as that of the transportation man. It was put in over the lofty ballroom and spans a broader space and holds a greater weight than the architects ever before ventured to put one one girder in a similar position.

"To get it through the streets and into its final position was a job calling for teamwork from everyone in our organization, coupled with the cooperation of all the numerous other allied interests. We had eight pieces of steel to deliver in that lot. Seven of them weighed 70 tons each and then came the big 93-ton girder.

"The railroad company set the flat car out as close to the Stevens site as possible, but at that it was a mile away, and the route thither included several short, complicated street corner turns where plenty of trouble could be naturally expected. We also had to traverse a main business thoroughfare, State Street, part of the way.

"Every step of that route was carefully mapped out and men assigned to positions to handle every move or meet every contingency. Hours were spent in carefully coaching them. A time schedule had been prepared and the street car company had its supervisors on hand to control operations of the cars. A police escort was provided and we were given the right of way. It took just twenty minutes to traverse that mile to the hotel site and it was made without a hitch or slip up anywhere.

"But that is not an unusual record. In more than sixty years of doing business the company has never suffered a serious loss. Occasionally we have tipped over in transit and that has caused new problems of reloading. We have never dropped anything that was being raised by rigging. And since the beginning only one employee has been killed. Our president, J. X. Galvin, is a member of the Chicago Safety Council and preaches 'safety first' day and night. On the big, dangerous jobs the men seem to fully realize the risks. They are all keyed up to take extra care and that accounts for our good fortune. We have more trouble caused by little things like nails sticking up through a board than we ever had with steel cables or truck axles that might break but don't."

THE passing years have forced the Pennoyer company to make many changes in equipment, to keep up with new developments. Horses were re-

## DeVilbiss

Spray-Painting Equipment—Spray  
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 —Exhaust Fans—Air Compressors  
 —Hose and Hose Connections—  
 Oil Guns.

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**TOLEDO, OHIO**

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## Series 900 WALKER Hydraulic Jacks

Give you extra value  
 features for car, truck  
 or bus equipment and  
 heavy duty bench work  
 or shop jobs: One of ten  
 sizes—capacities 1 1/4 to  
 20 tons—at left. Order  
 from your jobber—and  
 see the complete line of  
 Walker Jacks for every  
 service need.

**WALKER MFG. CO.**  
 Racine, Wisconsin

## Pin Hole Honing is Cheaper and Better than Reaming

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**\$24.00**

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## FLEET OPERATORS!

Investigate the new method of reducing cylinder wear and shortening time required for overhauls. These new piston rings of frictionless bearing-metal are saving truck owners big money everywhere. Write today for details.

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GRID CONSTRUCTION  
Seat Cushions or Fillers

All Sponge Rubber Construction  
Cheaper Than Springs • The Most  
Comfortable Cushion Ever Made

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**SPONGE RUBBER  
PRODUCTS CO.**  
DERBY CONN.

placed by motor cars. Wooden wagon wheels gave way to solid steel wheels which were replaced by rubber tires from the early solid style to the latest pneumatic types. Often when the market does not offer what is needed for a particular job, apparatus is specially designed—tailored to order—to serve the desired purpose.

Mr. Koepke points with special pride to the trailer built for the one purpose of hauling the 85-ton generator his organization installed in a new electric powerplant at Joliet, Ill. The truck has a capacity of 100 tons and the eight wheels at the rear end were located by mathematical calculation to distribute the load with the precision of a delicate instrument.

The company's present equipment includes 50 trucks and 40 trailers of various kinds. A 10-ton Caterpillar tractor is available for use in soft ground around buildings under construction, where a truck would be mired. And there is another 5-ton "cat" with rubber treads for use inside buildings to avoid injuring floors. Nine trucks are

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**National**  
MACHINE & TOOL CO.  
JACKSON, MICHIGAN

Stop the most stubborn spring squeak instantly. Save time and money. Drive pointed end between leaves, attach grease gun and force grease through tool exactly where it's needed.

## PURIFY

crankcase drainings

for as little as  
**3 - 6 cents**  
per gallon

When sending for complete information let us know what your new oil purchases amount to each month; gal., per gal.

**SKINNER PURIFIERS, INC.**  
2220 DALZELLE, DETROIT

## WE INVITE COMPARISONS

Compare Gardiner Flux-Filled Solder with any other make—compare the work it does—notice the time it saves. A generous sample upon request.

And then compare the price—Gardiner actually costs less than even ordinary solders. Your jobber can supply you—insist on having "Gardiner."



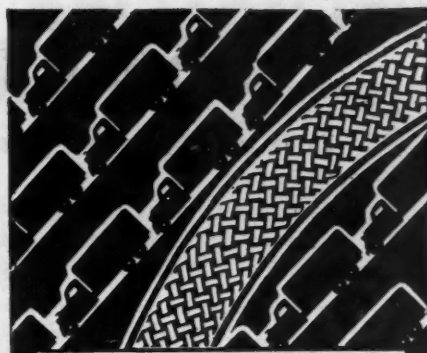
4832 So. Campbell Ave., Chicago, Ill.



Raised five floors, this 40-ft., 18-ton "cooker" was put to bed like a babe

equipped with double drum power winches, said to be the first of their type ever used in Chicago.

In talking with Mr. Koepke, it is obvious that he finds a lot of pleasure and satisfaction in his job. It's hard to decide though what phase of it he likes best. As he talks about the obstacles that had to be hurdled in getting that Stevens Hotel girder into place, you



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NEWARK, NEW JERSEY**

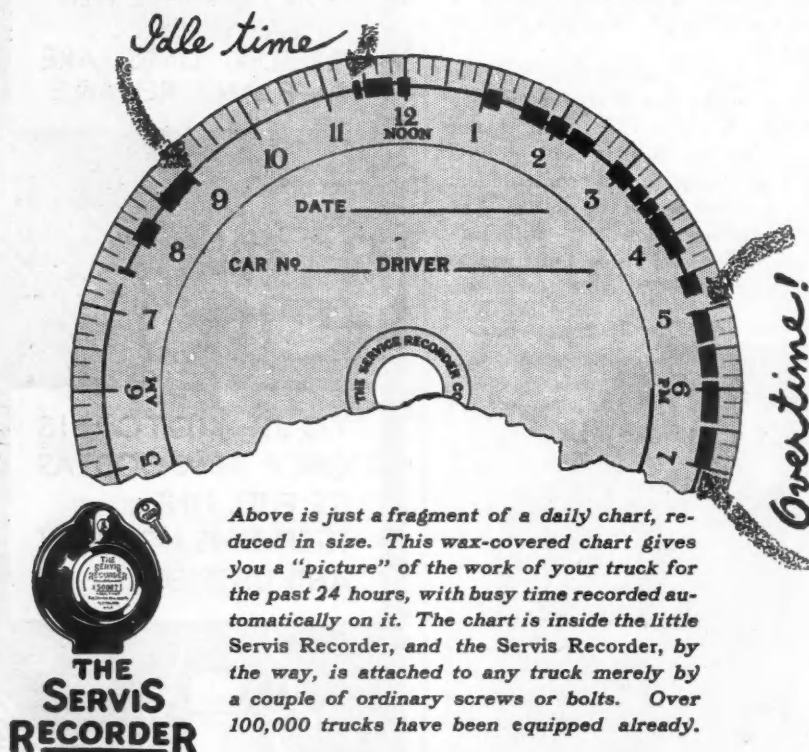
# OVERTIME!

## Is it a habit with your truck?

One thing is certain—if your truck wastes an hour *during* the day, it will have to take an hour *after* closing time to get a day's work done. And that is what is happening with thousands of motor trucks.

If your truck is busy during the day and still has to work overtime, then pay your overtime cheerfully, and on the basis of the chart of the Servis Recorder. Don't have any more arguments about over-

time. And don't have your trucks working after hours when they could finish everything *during* hours. The Servis Recorder will tell you on its chart the whole situation at a glance.



Write for booklet "Ten Ways of Getting More Work Out of Motor Trucks"

**THE SERVICE RECORDER COMPANY, Cleveland, O.**

might think this undertaking was the pride of his heart. Then he begins telling about the huge steel "cooker," set up for Libby, McNeil & Libby at the Chicago stockyards. It was 40 ft. long, weighed 18 tons and was about as clumsy an object to handle as one would want. It had to be raised outside the building in a spot where a slip might have tied up the main line of a busy railroad. But it was raised five floors, and maneuvered around in mid-air, so that it could be shoved through a hole in the wall and set up where wanted. No, nothing happened.

And then Mr. Koepke drifts into an account of the great granite and bronze

monument moved intact from one site to another in Lincoln Park. It makes one realize that transportation of a work of art is also an art in itself.

**T**HERE'S history and a bit of "hooray" in the business, too, when the job calls for the moving of several ponderous links of the iron chain Washington's army stretched across the Hudson River when they were trying to keep out the British ships during the Revolutionary War. The job of moving that chain across the city to its new home in the Chicago Historical Museum was executed with the help of Legionnaires, flags and fireworks.

Then there's "The General." You saw it, perhaps, that historic old locomotive which stood at the entrance to the "Wings of a Century" pageant at Chicago's 1933 Century of Progress exposition? In 1862, ten years before the Pennoyer company was born, "The General" made history and a reputation for valor in daring raids along the rebel front around Chattanooga, Tenn.

When it came to Chicago for the Fair, however, it was a bit feeble and doubt existed about its ability to find its way around. "Handle with care" was the one injunction accompanying the waybill and Mr. Koepke's people made special effort to oblige. Gently "The General" was eased off a flat car, placed on a Pennoyer trailer and trundled down to the lake front show grounds. Not a bolt was jarred out of place. "But it sure looked odd," Mr. Koepke remarked, "to see a locomotive hauled around by a motor truck."

The weight? Oh, barely 25 tons. Just an ordinary everyday job for the Pennoyer folks.

The business is not, however, all sentiment. The question of costs is as bothersome a problem as some of the engineering details. Every job is different but cost records for each of them are carefully preserved. When a new job comes in, past performances are studied and some basis found for estimating charges.

In 1929 construction work ceased, but Mr. Koepke finds a lot of satisfaction in the fact that the company's average payroll of 200 employees was practically undisturbed.

One way that was accomplished was by developing a city-wide pick-up business to serve the six long-distance freight trucking lines that use the Pennoyer warehouse as their Chicago terminal. But that's another story.

**A**FTER the interviewer left the company's headquarters at 742 West Polk Street he stopped for a moment at the spot nearby where James C. Pennoyer got his start. A bronze tablet says that on that spot stood the stable in which Mrs. O'Leary's famous cow pulled a bovine blunder. By kicking over a lantern, Bossy touched off the great Chicago fire of Oct. 9, 1871 and thereby opened the way for Mr. Pennoyer to get busy with his ash cart.

That cow stable stood just two short blocks from the Pennoyer Merchants Transfer Company's present office and warehouse. But what a winding trail through 63 years those two blocks really span! It's a trail filled with romance and it is closely entwined with the very blood stream which has brought life to a big city.



## Fleetmen Are Cranks on Crankcase Oil

(CONTINUED FROM PAGE 13)

that they are unable to control oil purchases to this extent.

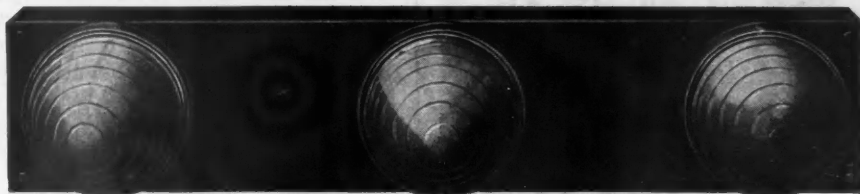
For summer use SAE viscosity No. 40 is the most popular oil. Twenty-one fleets use No. 40 and No. 40 only during the summer. Next comes SAE No. 50 with 11 users and No. 30 with eight. No. 20 has one user and No. 60 has one. In combinations Nos. 30 and 40 are used by eight fleets, Nos. 40 and 50 are used by five fleets, Nos. 30 and 50 are used by four fleets and Nos. 20 and 30 and 40 are used by four fleets, while only one fleet likes the combination of Nos. 50 and 60. In triple combinations, that is, where three different viscosities are used in one fleet, the combination of Nos. 30, 40 and 50 is preferred by five fleets, Nos. 20, 40 and 50 is the choice of one fleet and the combination of Nos. 10, 20, 30 and 40 is preferred by one fleet.

When winter comes the viscosities go to smaller numbers. There is no No. 60 in the list and only one No. 50 and that one is used in a combination with other lighter oils. No. 30 is by far the most popular viscosity, being used in 21 fleets exclusively. No. 40 is next with 10 fleets, followed by No. 20 with six fleets, 20W with three and 10W with one. The combination of Nos. 30 and 40 and the combination of Nos. 20 and 30 lead the combinations for winter use with eight fleets each. Nos. 20 and 40 in combination have two users, Nos. 10 and 20 have one and so does the combination of 10W and 30. Three viscosities in combination are used as follows: Nos. 10, 20 and 30 used by six fleets; Nos. 20, 30 and 40 used by two fleets, and increasing the combinations to four viscosities there remain two fleets that use Nos. 10, 20, 30 and 40 and one fleet that uses Nos. 10, 20, 40 and 50.

**CHECKING** through this same section of the questionnaire from another angle it becomes evident that two fleets use SAE No. 40 year around and two fleets stick to SAE No. 30 all of the time. Nos. 30 and 40 in combination is used by two fleets all of the time and one fleet operator states that he uses the same oil winter and summer, but neglects to give the viscosity. One operator describes the oil he uses by the terse term "various."

The oil choices just outlined are, in 56 cases, lighter than the oil the same fleet was using five years ago. Twenty-

## DIETZ—FOR RELIABILITY



No. 29

### Equip With **DIETZ** Quality Lamps and Accessories For Motor Trucks & Buses

**T**HERE is too much wear and tear on motor truck lamps and other accessories to take chances with inferior equipment.

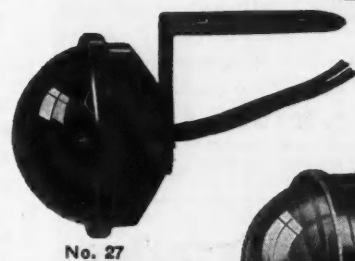
Since 1840 and continuing to the present day, the name **DIETZ** on vehicle lighting equipment has meant style, quality and reliability of the highest order.

Let us send you our complete catalog of Motor Truck and Bus Lamps and other accessories.

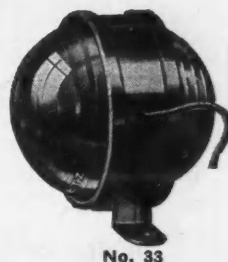
**DIETZ**  
Up-to-the-Minute  
MARKER LIGHTS



No. 26



No. 27



No. 33



No. 30



No. 31

**DIETZ**  
TRUCK  
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ALL DIETZ  
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one fleets are using oil of the same viscosity and two fleet operators do not know what the fleet was using five years ago. None are using heavier oil.

Drain intervals are not based on any standard practice. Different service conditions and different ideas among fleet operators have resulted in widely varying drain periods. The 1000-mile drain is still the most popular. Sixteen fleets follow this practice. The others follow in order: 2000-mile drain—eight fleets; 1500-mile drain—five fleets; varies—four fleets; twice yearly—three fleets. Two fleets do not drain at all.

Then follows: 1000 miles and 1500

miles—two fleets; 1200-mile drain—two fleets; 500-mile drain—two fleets; 10,000-mile drain—two fleets; summer 1500-mile and winter 1000-mile drain—two fleets.

Individual draining practices that are not duplicated by other fleets in this survey are: 1600-mile drain; 500 and 1000-mile drain; 1000-mile, 1500-mile and 2000-mile drain; 1000-mile without filters, 8000-10,000-mile with filters drain.

Other fleets operate on the following intervals: Cars 1000-mile drain and trucks 500-mile drain; 1000-2500-mile drain; 4000-mile drain; drain every 20

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## PER-MAX

*the Permanent  
TRUCK FINISH*

Ask for list of prominent fleets successfully using PER-MAX. We will send one pint

of black for test if you will write us giving the size of your fleet.

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Manufacturers of Automotive Finishes  
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## FWD Trucks

are available in sizes ranging in capacities from 1½ to 15 tons.

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Clintonsville, Wis.  
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TRADEMARK  
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HOSE CLAMP  
WITH THE THUMBSCREW

Standard equipment hose clamp of the automotive and airplane industry. Your jobber has them.

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Governors  
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*"Standard Equipment"*

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Detroit

working days; drain four times yearly; drain every 3000 miles; 500 and 750-mile drain; 2500-mile drain; drain every 100 working hours; monthly or 1000-miles; drain between 600 and 1000 miles; drain as truck manufacturer recommends; drain some every 15 days, others every 30 days; drain without filters every 1000 miles and with filters every 1500 miles.

The list continues on with: Drain per analysis; diesels 1000-mile drain, gas engines 2000-mile drain; 1500 and 8000-mile drain; 800 and 1500-mile drain; 1500 and 2500-mile drain; drain twice monthly; 700 and 1000-mile drain; 700-mile drain and 800-mile drain. One fleet operator drains every 1000 miles in summer and 600-800 miles in winter, 1000 miles without filters and when oil gets dirty with filters and 1000 miles in winter and 2000 miles in summer.

Tied in closely with the oil drain periods is the matter of oil filter equipment. The vehicles of 46 fleets in this survey are equipped with oil filters, 17 fleets are partly equipped with filters and 14 fleets do not have filters.

In the survey, operators were asked to name the oil filter they prefer. Fifty expressed a preference. In this group one make stood out above the rest with 24 calls. Since there was no intention of publishing names none will be mentioned here.

**T**HE efficiency of the different makes of filters, the condition of engines and the determination of suitable drain periods is ascertained in most fleets by positive means. That is, these factors are determined upon by analysis of crankcase drainings. Forty-six fleets obtain a periodical analysis of drainings and 34 fleets do not.

Thirty-nine fleets take advantage of reclamation of crankcase drainings as an economy by reclaiming oil and 41 do not. If the two fleets who do not drain at all are subtracted from the 41 who do not reclaim, there is an exact balance between the fleets who do and those who do not reclaim oil.

Of the 39 fleets reclaiming oil, 10 use the reclaimed product for refilling crankcases, 15 use it for replenishing only and 15 fleets used reclaimed oil for both refilling and replenishing.

In answer to the question, "Do you use colloidal graphite?" seven fleets answered "yes," one answered "some," one said "in some new trucks," one said "for certain purposes," one said "experimenting" and 65 fleets answered "no."

### Four Zones for Chevrolet

The Chevrolet company has established four new sales zones—in Seattle, Richmond, Charleston and Columbia.



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Write or wire today for further information how Mastercrafts can earn more money in your line.

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## THORNTON

Dual Ratio Four Rear Wheel

**DRIVE  
FOR TRUCKS!**

*Is setting new records*

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The complete line  
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truck into a **RUGGED, POWER-  
FUL FOUR WHEEL DRIVE** able  
to do the job with ease where  
much heavier trucks fail, and at  
a fraction of the cost.

Write

**ALMA MANUFACTURING CO.**  
ALMA, MICHIGAN

### Truck Transportation Red Book

The truck transportation encyclopedia  
known as "The Motor Truck Red Book"  
has been brought out in a 1936 revised  
edition by the Traffic Publishing Co., 100  
Sixth Ave., New York. In respect to Fed-  
eral and State laws, rules and regulations  
affecting truck operations the edition is  
up-to-date. The Motor Carrier Act is pub-  
lished in full. The book touches prac-  
tically every matter involved in the broad  
subject of truck transportation. The special  
offer net price is \$5.

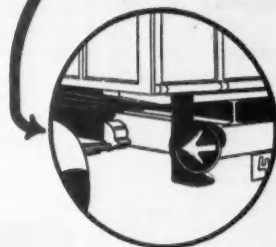
DECEMBER, 1935

## New Products on Parade

(CONTINUED FROM PAGE 85)

### Dietz Direction Signal

THE Dietz Pilot direction signal gives  
definite warning at both the front and  
rear, when a truck is making either a  
right or left hand turn. It is operated by  
throwing a switch on the control box lo-

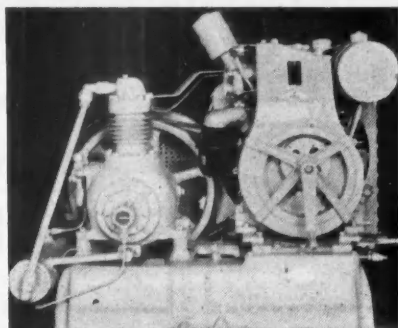


cated on the steering column within easy  
reach of the driver's hand. When this  
switch is thrown an arrow signal is il-  
luminated in the front and rear lamps on  
the side the turn is to be made, while  
the corresponding lamps on the other side  
of the truck remain unlighted.

The No. 350 outfit consists of two front  
and two rear lamps, and a completely  
equipped control box. Furnished for  
either a single or double contact wiring  
system. It is a product of the R. E. Dietz  
Co., 60 Laight St., New York City.

### Refrigeration for Perishables

A **UNIQUE** feature of the Williams Ice-  
O-Matic refrigeration equipment for  
trucks is the dual type electric motor em-  
ployed to run the compressor. This dual  
motor, which is really two motors in a  
single frame, has a DC end which op-  
erates from the special generator driven  
from the truck engine, and an AC end  
which operates from any standard electric  
light circuit. This dual construction per-  
mits operation of the refrigerating system  
on the road and when the truck is tied up  
at the terminal. The temperature inside  
the body is controlled thermostatically.  
The Williams Oil-O-Matic Heating Corp.,  
Bloomington, Ill., is the builder.



# BURCH

Balanced  
**POWER**  
for RAISING  
or LOWERING

**DUMP  
BODY  
HOIST**

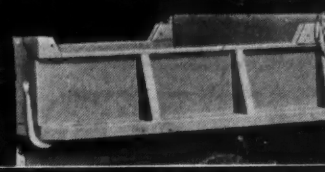


ONLY  
**ONE  
MOVING  
PART**

Balanced power for raising or low-  
ering—automatic locking, any posi-  
tion—one moving part—no gears—  
no oil lines—no heating or foaming  
of oil. Plain and Braced Side Bodies  
—1½ and 2 Yard capacities.

**FAST! POWERFUL!**

Write for Literature



**THE BURCH CORP.**  
Dept. A - CRESTLINE, OHIO

**Sterling**

**QUALITY MOTOR TRUCKS**

**POWERED WITH**

**DIESEL OR**

**OIL-BURNING ENGINES**

**WILL INCREASE**

**YOUR PROFITS**



Write For Facts



**STERLING MOTOR TRUCK CO., INC.**  
MILWAUKEE, WISCONSIN

# WHAT IS

- A BRUTE FOR STRENGTH
- A BABY TO HANDLE
- A PROFIT MULTIPLIER

# ?

Answer: Any light truck equipped with the sensational

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You can pack and haul safely, rapidly, and at absolutely minimum cost—eight tons payload on an ACME SIX WHEELER-equipped 2-ton truck. And that truck handles as sweetly as before!

Further—we absolutely guarantee every part in the entire unit for the life of the unit! Beat that!

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And we want to prove this to you—at our expense.

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Pick out the toughest job that comes into your shop. Ask us to send you a Free ALUPAK Head Gasket for it. Install the ALUPAK—and let results alone guide you in buying future gaskets.

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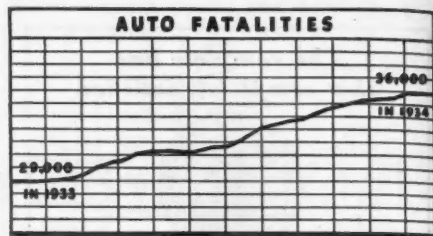
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Name.....  
Address.....  
City..... State.....  
My Jobber's name is.....

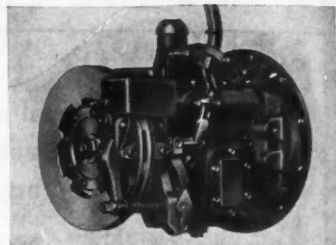
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● Newspeeds, new driving conditions, new responsibilities. And, now, fortunately, new brakes. TRU-STOP Emergency Brakes, with powerful leverage—fast, but smooth, in operation. And, above all else, positive in action. Positive in release, too.

TRU-STOP Emergency Brakes do a perfect job of braking—without chatter, without tendency to grab. Ventilated discs quickly dissipate the heat generated by braking. Easily adjusted and serviced—and require very

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**In Business for Your Safety**  
Manufacturers of the famous WEED TIRE CHAINS



## TRU-STOP EMERGENCY BRAKE

K-D Extends Sincere Holiday Greetings

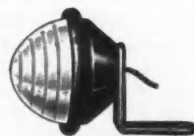
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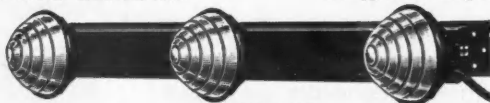
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IMPROVED, APPROVED  
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Safety,  
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All types for all purposes.



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Channel body. Enclosed wiring.

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